The Iron Age

A Review of the Hardware and Metal Trades.

Published every Thursday Morning by DAVID WILLIAMS, No. 10 Warren Street, New York.

Monthly Edition. *New York, Thursday, July 1, 1875.* $1·18 a Year, Including Postage. Single Copies, Ten Cents.

Improvement in Screw Cutting Machinery.

Fig. 1 shows a new screw machine with the Parkhurst patent wire feed attachment. The device does not get out of repair, and is a great assistance in facilitating work. It feeds and holds the wire in position without stopping the machine or delaying the work, as the operation of setting forward the wire and firmly clamping it is performed by a single movement of a lever. The turret is of steel, is self-rotating and self-fastening, and the tools are held securely by convenient clamps. The cone has 3 grades, carrying a 1¼ inch belt. The countershaft is fitted with Pratt's patent friction clutch pulleys. Case hardened wrenches and an oil tank go with the machine. The collets for this machine will receive wire from No. 0 to No. 10, inclusive, of Brown & Sharpe's wire gauge. We believe this machine is unsurpassed for efficiency and perfection of work and ease of manipulation. The revolving head may be made to receive six distinct tools, including gauging-stop for wire feed, so that every operation in the construction of a screw from the wire or rod, is performed successively, without any removal of the work, stopping, or change of the tools. A cross-rest with tool posts is attached to the wire feed machines, except when otherwise ordered. The Parkhurst patent wire feed is operated while the machine is running by a simple movement of a lever, and has any range of length that may be desired. It results in a great saving of time where screws are to be made from the wire or rod.

The second figure represents some of the screws made on this machine, varying in length, including the heads, from 1¾ inches to 5-16 of an inch, and in diameter of shank from 5-16 to 1-16 of an inch. They are of steel, iron or brass, and were produced by the usual box tools which will be furnished with each machine, as ordered. These tools are made by the Pratt & Whitney Company, of Hartford, Conn.

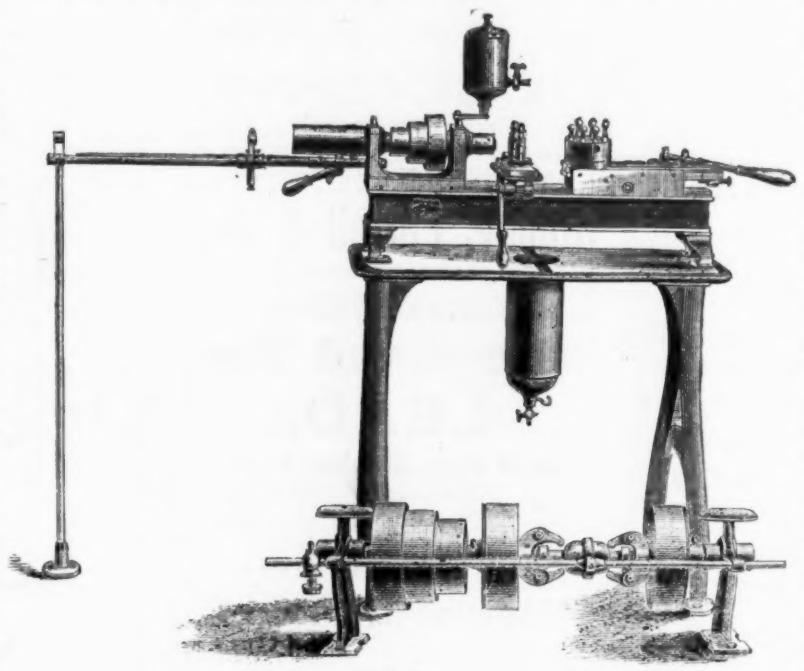


Fig. 1.

Fig. 2.

REVOLVING TOOL-HEAD SCREW MACHINE, WITH WIRE FEED, BY THE PRATT & WHITNEY CO.

The Government Tests of Iron and Steel.

United States Board appointed to test Iron, Steel, etc.—Committee F.—R. H. Thurston, L. A. Beardslee, U. S. N.; Q. A. Gillmore, U. S. A.

STEVENS INSTITUTE OF TECHNOLOGY,
Department of Engineering,
HOBOKEN, N. J., June 25, 1875.

The board appointed by the President of the United States, under the provisions of an Act of Congress, approved March 3, 1875, "to test iron, steel and other metals," has instructed this committee to continue an investigation of those modifications of the various properties of the metals which are produced by changes of temperature.

The committee are desirous of supplementing these experimental researches with such results of other experimental work and of observation as may be obtainable from authentic sources; they, therefore, solicit such contributions from investigators and observers as may be deemed valuable as assisting in the task assigned them.

The behavior of rails and of machinery exposed to the extremes of temperature observed in northern latitudes, where exposed to wear or to breakage, will be likely to afford valuable data. The character of the fracture and the texture of the abraded surfaces, as well as the statistics ordinarily collected, should be noted. Specimens exhibiting peculiarities of behavior or appearance, and photographs of masses which it may not be convenient to forward, will be of value. Where exact quantitative analyses of metals exhibiting unusual characteristics can be given, they will add effectively in the determination of the causes of such peculiarities.

The statistics of well managed railroads are expected to afford useful and reliable information. Rolling mills producing rails and other forms of rolled iron which are tested by the drop may be able to furnish more accurate statements of the effect of changes of temperature in modifying resistance to shocks.

Some experimental work has already been done in this field, and it is desired that the results of such researches may be communicated in as great detail and with as much accuracy as possible. Published monographs, reference to papers published in scientific, engineering or other periodicals, and unpublished papers, will be received as valuable contributions.

All assistance rendered the committee in the endeavor to ascertain the character of the change of the force of cohesion produced in the metals and their alloys by variation of temperature, to determine the mathematical expression of that law, and to obtain such formulas, either exact or approximate, as will make these results conveniently and practically available to engineers and constructors, will be properly acknowledged.

R. H. THURSTON, Chairman.

Working Heavy Grades in Switzerland.

A railroad has recently been opened to the summit of Mount Uetliberg, Switzerland, which overlooks, at a hight of about 1300 feet, Lake Zurich, and is much visited by tourists for the sake of the view. The road was designed in 1872, and it was finally decided to depend upon adhesion simply, limiting the grades to 7 per cent., or 370 feet per mile. The locomotives were built by Krauss & Munich, who agreed to supply them, weighing 27½ tons (55,000 lbs.), which could haul up this grade four cars, carrying 40 passengers each, gross load being 38,500 lbs. The total length of the road is about 30,000 feet, or more than 5½ miles. The lowest grade is 332 feet per mile, but 59 per cent. of the whole length is of grades exceeding 264 feet per mile. The curves are of 500 and 450 feet radius, the latter coinciding with a grade of 327 feet per mile. The track is of the standard gauge, and the rails, of iron, weigh 60 lbs. per yard. There are three tank locomotives of the Krauss pattern, with six drivers coupled, each 36 in. in diameter, and with a wheel base of only 6 ft. 8 in. They weigh 41,800 lbs. empty, and in service from 52,800 to 55,000 lbs. The heating surface is about 770 square feet, the diameter of piston 12½ in., the stroke 21½ in.

The passenger cars, of which there are six, have platforms and a central passage, as in American cars (which is the common construction in Switzerland), capable of accommodating 40 passengers. They have a box for baggage below the frame, between the wheels; their weight empty is 12,650 lbs. There are also three freight cars.

The road when complete will have cost about $300,000, gold.

The first ascent was made April 24 of this year. The engine pushed up three cars loaded with ballast and workmen, a total gross load of 27½ to 30 tons. This load was moved without difficulty at a speed varying from 8 to 10½ miles per hour, maintaining a steam pressure of 170 lbs.

The descent is made with compressed air, by means of an apparatus used on the engines of the Rigi Railroad. The speed was 15½ to 18½ miles per hour.

At trials made by the professors of the Zurich Polytechnic School the weight hauled was about 627½ tons, the traction exerted about 7500 lbs., and the work about 200 net horse-power.

A peculiar feature in the working of this road is the use of a jet of water against the rails, in front of the wheels of the locomotive, sufficient to wash the rails completely. It was observed long ago that the influence on adhesion of a slight humidity such as that deposited by a fog, and that of a veritable layer of water deposited by rain, are entirely different. On the Swiss Central Railroad a jet of water is used on the front wheels of certain engines to facilitate the passage around curves, and the effect on the durability of the tires has been remarkable; but this jet of water, which was only intended to lubricate the inside part of the railhead, moistens the whole surface in contact with the tire. No modification of the adhesion has been observed as the result of this; this jet of water does not dispense with the use of sand, while at Uetliberg absolutely no use is made of sand, but water is employed exclusively.

These facts were recently communicated to the French Society of Civil Engineers by M. Mallet, and we find them reported in *La Revue Industrielle.*

M. Mallet also described briefly another Swiss mountain railroad, the Rigi-Kulm Line and the lake of Zug, about seven miles long, six miles of it being worked with a peculiar cogged wheel arrangement, or something similar in effect, by which grades of 1056 feet per mile are surmounted, there being one section more than a mile and a half long with a grade very little less. The radius of the curves, which is uniform, is 600 feet.

Special attention was called to the locomotives by M. Mallet; ordinary boilers with horizontal tubes are used, but special arrangements are made to enable them to pass from a level to an inclination of one in five. In the first place the tubes are quite short, 7 feet 9 in., though longer than the tubes used in vertical boilers which are only 6 feet 3 in. Then the boiler is so placed as to have an inclination forward of one in ten when the wheels are on a level track, so that on an up grade of one in five it has only the same inclination backward.

In order to keep within the limits of weight of 35,200 lbs., the greatest care had to be taken in the construction of the engines. Steel was employed on the most extended scale; the boiler, with the exception of the fire box, the tubes, the frames, the axles, the wheels, the cogs and the machinery are all of steel.

One of these engines when tried generally made 140 revolutions of its drivers in a minute, and upon very steep grades the speed did not fall below 120 revolutions. The advance being nearly 11 feet per revolution of the adhering wheel, which turns 0·418 of a revolution to one turn of the driving axle, the speed per hour = 60 × 140 × 0·418 × 11, feet = 38,625 feet = 7·3 miles per hour. It had been a quite general opinion that such an engine could not run faster than about four miles an hour.

These engines push up a car of the Rigi pattern with seats for 54 passengers which weighs about 33,000 lbs. loaded. The trip to the summit is made in about an hour. Similar engines are used on a line from Rorschach to Heiden, where the steepest grades are 477 feet per mile, but there the engines take up three or four car loads of passengers, or a gross load of 25 to 33 tons.—*Railroad Gazette.*

California Borax.—The *Alta Californian* says: The great borax lake will afford a very large business. Very extensive works are now nearly completed for the refining and purifying of this borax for shipment. Millions of tons of crude borax are in sight in this immense deposit. Stimulated by the action of the Railroad Company, the Borax Company have put up large works and will soon be prepared to turn out from 20 to 50 tons of pure borax per day. This will add largely to the freights of the railroad. The deposit of borax is simply unlimited. It covers an area of 18 miles in length by six to eight miles in width, covered with crude borax from 3 to 5 feet thick. The crude material will average from 20 to 40 per cent. Ten thousand men would not take out the deposit in 50 years, and it is constantly increasing.

The Brown Iron Company's Works.

The Chicago *Journal* says: An arrangement has been made by the Joseph H. Brown Iron Company to enlarge the capacity of their works. Last March a contract was let for the erection of a mill which would produce 50 tons of iron a day. By mutual consent this contract has this now changed so as to make arrangements for a producing capacity of from 150 to 200 tons per day. The plans of the immense structure are now complete, and already the contracts for the machinery are being filled. To say that this will be the peer of any similar manufacturing establishment in the country is to say the truth. A detailed list of the machinery to be set up in their first mill proves that the company makes the assertion on good grounds. The list embraces the following pieces:

One 22 inch beam mill, with five stands of rolls for making heavy beams and machinery iron. This will be driven by an engine 40 x 48 inches, with a 35 ton fly-wheel, probably as heavy a one as is in use in this country.

One 28 inch muck train, with three run of rolls and a 35-ton rotary squeezer, to be driven by a 28 x 60 inch engine and a 26 ton fly-wheel. This will have capacity for muck iron second to none in the country.

A 14 inch merchants' mill, including five stands of rolls, to be driven by a 26 x 30 inch engine and a 15 ton fly-wheel. It will have all necessary fittings for producing miscellaneous iron.

A 9 inch mill, with five stands of rolls, for making hoop and guide iron, to be driven by a 24 x 36 inch engine and a 15 ton fly.

In connection with the above there is to be built all the necessary saws, straightening machines, muck shears, bar shears, crushers, pulverizers, etc., each tool being driven by a small engine.

One of the above trains will have a producing capacity of 90 tons each 24 hours. The cost of these immense works will exceed $2,000,000, and will be paid for as the machinery is put in place. It is expected that it will be completed by the 1st of September, and the company will be ready to receive supplies by November 1. Messrs. Robinson, Rea & Co., of Pittsburgh, furnish the machinery, excepting the Siemens furnaces and boilers, which will be constructed by the company itself. The plans contemplate the erection in the near future of blast furnaces and other mills of such a character as to give the establishment the highest rank among iron manufactories in the United States.

The company is composed of Samuel, George W. and Charles B. Hale, of Chicago; Richard Brown and William Bonnell, of Youngstown; James T. Torance, of Chicago, and Joseph H. Brown, of Youngstown, O., the latter gentleman being president of the company. They have the capital, and are reliable, and have located in a place adapted to their business.

Owners of property at South Chicago, where the works are situated, have donated ninety acres of land on the Calumet River. They have also constructed a slip 750 feet long and 14 feet deep, which is sufficient to let the largest vessels come close to the works. A railroad line has been constructed from the place so as to connect with all the lines leading out of Chicago. There is at hand every facility for obtaining cheap stone. With all these advantages the gentlemen see no reason why they cannot compete successfully with any other corporation, and, by the cheapness of their productions, be the center for supplying the Northwest.

A Dead Blast Furnace.

A correspondent of the Greenup (Ky.) *Independent* communicates the following in an interesting and chatty letter, under date of June 18th:

The valley of the East Fork, Lawrence county, Ky., with its large and well attended farms, its houses neatly whitewashed, its inhabitants thrifty and intelligent, and bridges constructed across its banks, is quite attractive, and more so was it at this time. A funeral sermon was to be preached at the graves of three citizens, lately deceased, the masons were to march around the graves, and everybody was going—so was I told. But I could not stop to attend the funeral rites at these graves. I left the crowd, following the course of East Fork, bound for a grave of a different nature, for the grave of Sandy Furnace. Nobody at Catlettsburg seemed to know anything about it—in fact its existence was positively denied by men who in their youth must have seen pig iron made at that furnace stacked upon the banks of the Ohio River, at the mouth of the Sandy. But some obliging merchant, better posted than others, at last headed me for Judge Rosse's place on Bolts Fork, 22 miles distant from Catlettsburg.

Big Sandy furnace is situated within sight of the Judge's house, 7 miles southeast from Geigersville, and 8 miles from the mouth of Bear Creek, the former shipping point on Big Sandy, whence the iron used to be floated to the mouth of that stream, there to be stacked or reloaded. Wurts, Jones & Co. were the last owners of this furnace property, originally consisting of 1500 acres of land in fee simple and 3000 donations. This firm suspended operations in 1855 and the lands were then sold at Sheriff's sale to Tom Means, Esq., who afterward traded it off to Judge Ross, the present owner. William Wurts was the enterprising man, who first came here in 1849 and afterward erected the furnace stack, which bears the following inscription:

SANDY FURNACE, No. 2.
1853.
M. WOLFFORD, BUILDER.

The stack still stands; so does the drop shed, the coal house and several of the dwellings, among which the manager's and the store house. But most of the buildings have gone to wreck. Their destiny is sealed. The short life of this place, full probably of strife, of toil, of hard work, of family happiness and misfortune, full of bright hopes and sad disappointments, may be added to the list of deserted villages, of which even this our new country can tell.

The yield of this furnace never exceeded 7 tons per day; and its lack of success is due to a peculiar irregularity of the geological formation. For while at Geigersville, 7 miles southeast, and at other points northwest from here, the Coalton coal vein is found in the upper parts of the hills, this vein appears here to be probably 70 feet under the surface, thus creating a basin, which has swallowed up the kidney and lower ores, leaving this locality nothing but a few ore veins of a rather doubtful quality. A top hill ore seems to have been the richest and most sought after, containing some 42 per cent. of metallic iron; this, however, was but little found. The limestone ore, on which large vein the furnace mainly depended, is not very rich in iron, but contains not less than 21·8 per cent. of lime, and could, therefore, be used only as a mixture with ores not containing any lime. This explains why even at the best it required 4 tons of ore to the ton of pig. The Rough and Ready ore, the highest workable vein of Lawrence, Carter and Greenup counties, whose location is some 200 feet above the red kidney ore, is also found at this place, running from 8 inches to 2 feet in thickness; but mostly mixed with calcareous rock, which renders its usefulness rather problematic. The iron made at this furnace had a good reputation for fine foundry purposes.

The Amboy *Democrat* says of the draw recently erected over the Raritan River at that place: This draw is, beyond doubt, a triumph of civil engineering. It is the longest in the world, measuring in its entire length 472 feet. It is known as a Pratt truss bridge, the trusses being 40 feet high in the center and 30 feet at the ends. Its width is 20 feet. The weight of iron is a little over 600 tons. The drum upon which the draw rests and rotates is 30 feet in diameter, the whole running upon a steel track. The whole structure, with very few exceptions, is composed of wrought iron of the very best quality. The center works upon 16 cone pivots, so arranged as to work with the least possible amount of friction. It is moved by rotating gear operated by a 20 horse-power engine attached to the drum, the whole being controlled with ease by the apparatus provided. Four hydraulic lifts are used to raise the whole structure from two to three inches before operating, by which a sure and perfect connection with the track at either end is assured, and the possibility of swaying with the wind avoided. The weight may be thrown entirely upon the center pivot or upon the drum, as necessity may require, or it may be equally distributed on both. Another device worth noting is that by the adjusting of 20 screw bolts around the pivot cap the whole draw may be raised or lowered as may be necessary to make the adjustment of the tracks perfect. The total cost of the draw is about $120,000; of the six iron spans, $60,000, making in all $180,000 for the iron work and machinery.

Metals.

ANSONIA

BRASS & COPPER CO.

19 and 21 Cliff Street,

(Adjoining Office of Phelps, Dodge & Co.)

Sheet Brass,	Sheet Copper,
Planished Brass,	Planished Copper,
Polished Brass Door Rails,	Copper Rivets & Burs,
Brass Wire,	Braziers' & Bolt Copper,
Hayden's Patent Brass Kettles,	Braziers' Rivets,
Brass Tubing,	Copper Tubing,
Lamp Burners,	Copper Bottoms,
Gun Burners,	Copper Wire,
	Iron Wire,
	Fence Wire.

A large variety of Wood and Bronze Case Clocks.

MANUFACTORIES AT ANSONIA, CONN.

Phelps, Dodge & Co.,

IMPORTERS OF

TIN PLATE,

Sheet Iron, Copper, Pig Tin, Wire, Zinc, etc.

MANUFACTURERS OF

COPPER and BRASS.

Cliff St., bet. John and Fulton,

NEW YORK.

A. A. THOMSON & CO.

Importers and Dealers in

Tin Plate, Sheet Iron,

ZINC, COPPER, WIRE,

Block Tin Solder, Solder, &c.

Nos. 213 and 215 Water and 110 Beekman Sts.,

NEW YORK

P. O. Box, 61.

T. B. CODDINGTON & CO.,

25 & 27 Cliff St., New York.

Importers of

TIN PLATES,

And METALS of all descriptions.

N. L. CORT & CO.,

Importers and Dealers in

Tin Plate, Pig Tin,

SHEET IRON, SOLDER,

ZINC, &c., &c.

220 & 222 Water and 115 & 117 Beekman Streets,

N. L. CORT, C. P. CORT, NEW YORK.

SCOVILL MFG. CO.,

419 & 421 Broome St., New York.

MANUFACTURERS OF

SHEET AND ROLL BRASS,
BRASS AND COPPER WIRE,
GERMAN SILVER, BRASS BUTT HINGES,
KEROSENE BURNERS.
METAL BLANKS CUT TO ORDER.
CLOTH AND METAL BUTTONS, in every variety.

PHOTOGRAPHIC GOODS.

MANUFACTORIES:

Waterbury, Conn.,
New Haven, Conn.,
New York City.

EVANS & ASKIN

BIRMINGHAM, ENGLAND.

Refiners of Nickel and Cobalt.

SOLE AGENTS

VAN WART & McCOY,

134 & 136 Duane Street, N. Y.

Nickel and Cobalt always in stock.

BIRMINGHAM, ENGLAND

SAMUEL A. GODDARD & CO.,

Commission Merchants and General Agents, execute orders for British manufactures on the lowest terms, and collect and forward goods for a very moderate payment. Agents for the sale of North Staffordshire Iron of a standard quality.

Metals.

Waterbury Brass Co.

CAPITAL, - - $400,000.

JOHN SHERMAN, Agent,

No. 52 Beekman Street, NEW YORK.

Mills at WATERBURY, CONN.

Sheet, Rolled and Platers' Brass,

GERMAN SILVER,

Copper, Brass and German Silver Wire,

BRASS AND COPPER TUBING,

COPPER RIVETS & BURS,

BRASS KETTLES,

WASH BASINS,

Door Rail, Brass Tags & Step Plates.

PERCUSSION CAPS,

POWDER FLASKS,

Metallic Eylets,

Shot Pouches,

Tape Measures, etc.

Manhattan Brass Co.,

Manufacturers of

Sheet Brass,	Olmsted Patent Oilers,
Brass & Copper Wire,	Prior Patent Oilers,
Copper Rivets & Burs,	Broughton Patent Oilers,
Brass Tubing,	Brass, Tin & Zinc Oilers,
Spelter Tubing,	Baby Carriage Hardware,
Satchel Frames,	Stationers' Hardware,

Cowell's Pat. Door & Gate Spring.

The only perfect Door Spring made.

Office, 83 Reade Street, New York.

Works, 1st. Ave. 27th to 28th Sts., N. Y.

J. H. WHITE, President. H. L. COE, Secretary.
STEPHEN A. MIDDLEBROOK, Treasurer.

Holmes, Booth & Haydens,

49 Chambers Street, N. Y.

ESTABLISHED 1853.

CAPITAL, - - $400,000.

Manufacturers of all kinds of

Brass, Copper & German Silver,

ROLLED AND IN SHEETS.

BRASS & COPPER WIRE,

Tubing, Copper Rivets & Burs.

BRASS & IRON

JACK CHAIN, DOOR RAIL.

German Silver Spoons,

SILVER PLATED FORKS & SPOONS,

Kerosene Burners, &c.

Works at Waterbury, Conn.

BALTIMORE COPPER WORKS.

POPE, COLE & CO.,

Are now Purchasing

Copper Ores

and smelting and refining at these works, where, with experienced workmen and unusual facilities, we are turning out **Ingot** and **Cake Copper** of unequalled purity and toughness.

We are prepared to buy Ores, Matte, Regulus and other furnace material, in any quantities.

Office, 57 South Gay St, Works at Canton, Baltimore Md.

A. HARNICKELL,

22 Cliff Street, New York,

Offers from store

Baltimore Ingot Copper,

Lake Copper, Braziers Sheets, &c.

Old Copper bought.

JOHN W. QUINCY,

98 William Street, New York,

Dealer in

AMERICAN AND FOREIGN SPELTER,

COPPER, TIN, NICKEL,

And Metals generally.

Philadelphia Nickel Plating Works.

John Hartman,

No. 1042 Ridge Avenue, Philadelphia.

ELECTRO-NICKEL PLATING

On all Metallic Articles finished in the best manner.

Office, 615 Jayne Street.

Fuller, Dana & Fitz,

Importers and Commission Merchants,

BOSTON. . . 110 North Street.

Tin Plates, Sheet Iron, Metals, Iron, Steel, Etc.

Wrought Iron Beams, &c., for Buildings.

Agents for the sale of Morris, Tasker & Co.'s Lap Welded Boiler Tubes. Patent Cold Rolled Shafting. The "Burden Best" Iron, *Tensile Strength* 70,000 lbs. Union Iron Mills' *Own Patent* Beams, Channels, Etc. The Celebrated Bessemer Steel. Brewer's *Original* Concord Axles. The Salem Lead Co.'s Lead Pipe.

SWEDISH, NORWAY, ENGLISH, AMERICAN and SCOTCH IRON. RUSSIA SHEET IRON.

FULLER DANA & FITZ'S *Price List on application.*

Metals.

The Plume & Atwood Mfg. Company,

MANUFACTURERS OF

SHEET and ROLL BRASS and WIRE,

German Silver and Gilding Metal,

Copper Rivets and Burs,

Kerosene Burners,

Shoe Eyelets, Lamp Trimmings, &c.

80 Chambers Street, New York.

13 Federal Street, Boston.

Rolling Mill, THOMASTON, Ct. | Factories, WATERBURY, Ct.

JOHN DAVOL & SONS,

Agents for

Brooklyn Brass and Copper Co.,

Dealers in

Ingot Copper, Spelter, Lead, Tin, Antimony, Solder & Old Metals.

100 John Street, N. Y.

SCRANTON BRASS WORKS, PA.

Manufacturer of **Brass Work** for Water, Gas and Steam; also of Maclaren's Pat. Compression Cocks, which are more simple and durable than any others manufactured, and especially adapted for sandy or muddy water, steam, air, gas and fluids of all kinds!

Special inducements are now offered to manufacture an article which has no superior and for which there will soon be an unlimited demand. Send for circular, &c.

J. M. EVERHART, Scranton, Pa.

W. J. HAMMOND,

Dealer in all kinds of

BRASS, COPPER,

Cast Iron, Wrought Iron,

AND STEEL SCRAP. *Cor. Eleventh St. and Duquesne Way, Pittsburgh, Pa.*

Bailey, Farrell & Co.,

MANUFACTURERS OF

LEAD PIPE,

Sheet and Bar LEAD,

Iron Pipe, Rubber Hose,

Hose Pipes and Screws, Oil Cups, Steam Gauges and Whistles, Globe Valves, Safety Valves, Iron and Copper Sinks and Bath Tubs, Lift and Force Pumps, and all kinds of Brass and Iron Goods for

WATER, GAS OR STEAM.

167 Smithfield St., Pittsburgh, Pa.

Licensed by United Nickel Company,

NEW YORK

Nickel Plating Co.

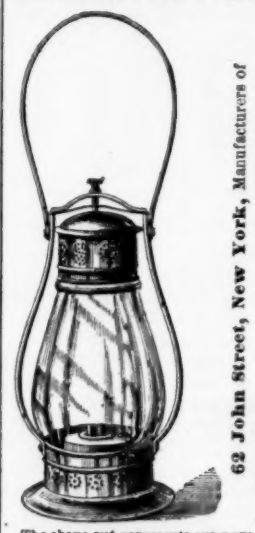
Works, 133 & 135 W. 25th Street,

Office, No. 18 Park Place,

ISAAC ADAMS, Jr., Prest NEW YORK.

Wire, etc.

BRIDGEPORT BRASS CO.,



62 John Street, New York, Manufacturers of

Brass Door Rail,
Fender Rail and Guard,
Lightning Rod Tips and Burs,
Gun Burner Shades & Rings,
Lamp Collars and Sockets,
Kerosene Oil Burners,
Corset Steels,
Brass Hand Lamps, &c., &c.

Gun Burners,
Brass Tubing,
Brass and Copper Wire,
Copper Bottoms,
Iron and Tinned Rivets,
Brass and Japanned Oilers,
Tin Tobacco Boxes,
Farmers' Lanterns.

ORDERS SOLICITED FOR SHEET BRASS.

Manufactories at Bridgeport, Conn.

The above cut represents our new **Marcy Lantern**, so that its advantages over others in market can readily be seen. With a tempered steel elliptic spring operating directly on the top, it can readily be adjusted and is firmly locked in its place. No sudden pressure on the guards or frame will displace the Globe; the Frame, Bail and Lock being all connected, there are no small parts to get lost or worn out. Arrangements complete for burning Kerosene, Candle and Oil.

Eagle Mfg. Co.

Manufacturers of

Ladies' Belt Buckles,

SLIDES, DOOR ROSES, ESCUTCHEONS, BAG TRIMMINGS,

and all kinds of small

BRASS GOODS.

Special attention given to new articles, and estimates furnished.

Factory,

34 and 36 Eagle Street, Newark, N. J.

Offices,

62 Duane Street, New York.
235 South 5th Street, Phila.

Wire, etc.

National Wire and Lantern Works.

Warehouse, 45 Fulton Street, New York.

HOWARD & MORSE,

MANUFACTURERS OF

BRASS, COPPER AND IRON

WIRE CLOTH,

Ship and Railroad Lanterns,

Signal Lights, Conductors' Lanterns

ADJUSTABLE GLOBE HAND LANTERN,

DESK AND OFFICE RAILING

Riddles, Coal and Sand Screens,

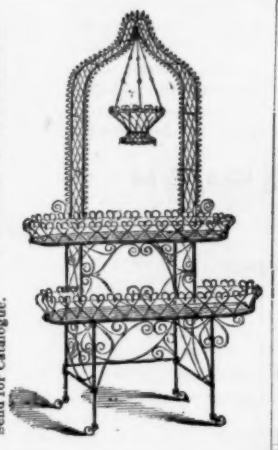
NURSERY FENDERS & SPARK GUARDS

Ornamental Wire Fence.

IMPROVED WIRE

Flower Pot Stands,

Wire Counter Railing, Wire Fencing, Steel Wire Casting Brushes, Weather Vanes, Stable Furniture, Bird Cages, Iron and Brass Wire Cloth, Twilled and Stiff Wire Clothes. Manufactured by E. T. BARNUM, Detroit, Mich. Send for Catalogue.



Cleveland Wire Works,

W. S. TYLER,

Office & Works, 754 & 758 St. Clair St., Cleveland, O.

Manufacturer of Steel, Copper, Brass and Iron Wire Cloth, Steel Locomotive Cloth, Steel Smut and Mill Screen Cloth, Steel Coal and Sand Screens, Steel and Brass Foundry Riddles, Wire Office Railing and Fencing, Ornamental Wire Work, Steel and Tinned Flour Selves, &c.

Geo. W. Prentiss & Co.,

HOLYOKE, MASS.,

MANUFACTURERS OF

IRON WIRE,

Bright, Coppered, Annealed and Tin Plated.

Coppered Pail Bail Wire, Bolt, Screw, Rivet, Belt Hook and Buckle Wire; Wire for the manufacture of Pins, Hair Pins, Wire Cloth, Heddles, Reeds, &c.

Also, Clock, Machinery, Spiral Spring and Piano Pin Wire, Plated Piano String Covering Wire, Plated Hook and Eye and Button Eye Wire, Tinned Broom Wire, fine Tinned Wire, and Tin-Plated Wire of all sizes and for all purposes. A specialty is made of the manufacture of

GUN SCREW WIRE

of all sizes up to one half inch in diameter, straightened and cut to order. Special attention is given to finishing orders to sample for particular purposes, where exactness of size is required. We work only the best Brands of Norway and Swedes Iron.

Wire, etc.

Washburn & Moen Mfg. Company

WORCESTER, MASS.

Established 1831.

PHILIP L. MOEN, Prest. WM. E. RICE, Treas
CHAS. F. WASHBURN, Sec'y

MANUFACTURERS OF

IRON AND STEEL WIRE.

WIRE RODS of all Grades; Round Iron, Rivet quality, 5-16 in. to ½ in., cut to any length.

Owners and exclusive Operators of the

PATENT CONTINUOUS MILL,

Producing Iron and Steel WIRE, in coils of 100 pounds, without SEAM or WELD.

Plain and Patent Galvanized Telegraph Wire,

Market and Stone Wire, Annealed Fence and Grape Wire in long lengths; Coppered Fall-Ball Wire; Rope, Bridge, Bolt, Screw, Rivet, Buckle and Chain Wire. Wire for the manufacture of Card Clothing, Heddles, Reeds, &c. Piano-string Covering Wire, Tinned Broom Wire and Tinned-plated Wire of all sizes. A specialty is made of Clock, Machinery, Gun Screw and Spiral Spring Wire, and Refined Wire to Pattern for particular purposes, from selected stamps of Norway Iron. Any grade of Wire furnished, Annealed, Bright, Polished, Coppered, Galvanized or Tin Plated. Wire furnished, Straightened and Cut to any length.

Steel Crinoline Wire, Patent Linen finish.
Unrivalled Steel Music Wire.

Steel Wire for Springs, Needles and Drills. Market Steel Wire kept in stock, all sizes.

Warehouse, 42 Cliff Street, NEW YORK.

THE

Gilbert & Bennett Mfg. Co.,

GEORGETOWN, CONN.,

MANUFACTURERS OF

Iron Wire, Curled Hair AND GLUE.

Brass, Tinned and Iron Wire Sieves, Coal, Oat and Hair Sieves, Hair and Wire Gravy Sieves, Brass and Iron Riddles, Brass and Iron Wire Cloth, Cheese Safes, Coal and Sand Screens, Wire Ox Muzzles.

Also Painted Screen Wire Cloth.

Wood Handle Stove Cover Lifters, Coal Hods Pressed and Patent Cast Shovels, Stove Scrapers and Pokers, Galvanized Conductor Strainers.

Gilbert's Rival Ash Sieve.

UNION METALLIC CLOTHES LINE WIRE.

The highest price paid for Cattle's Tails and Hog's Hair

WAREHOUSE,

273 Pearl Street, New York.

THE TRENTON IRON CO.,

Trenton, N. J.

JAMES HALL, Treas. CHAS. HEWITT, Prest.

IRON & WIRE.

Bar Iron.	Wire Rods.	Brazier Rods.
Market Wire,	Coppers.	Weaving Wire,
Screw Wire,		Spring Wire,
Ball Wire,		Buckle Wire,
Fence Wire,		Telegraph Wire,
Bridge Wire,		Chain Wire,
Square Wire,		Flat Wire,
Tinned Wire,		Coppered Wire,
Cast Steel Wire.		"Martin" Steel Wire

GUN SCREW IRON WIRE. NORWAY IRON WIRE.

Wire straightened and cut to any length. Represented in New York by

COOPER, HEWITT & CO., 17 Burling Slip.

ROEBLING'S WIRE ROPE

For Best

IRON or STEEL WIRE HOISTING, RUNNING or STANDING ROPES, or BEST GALVANIZED CHARCOAL WIRE ROPES FOR SHIP'S RIGGING,

Address, JNO. A. ROEBLING'S SONS, Manufacturers, Trenton, N. J. or 117 Liberty St., N. Y.

Wheels and Rope for transmitting power long distances. Send for Circular and Pamphlet.

New Jersey Wire Mill.

HENRY ROBERTS,

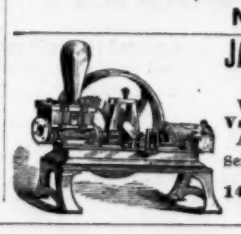
Manufacturer of

Steel & Iron Wire,

SPECIALTIES.

Tinned Wire, Tinned, Broom, Spring Wire, made from Bessemer Steel; Cast Steel and Iron Coppered Ball Wire; Rivet, Screw, Buckle, Umbrella, Fence Brush, Gun Screw Wire; Sewing Machine and Machinery Wire. Fine Wire for weaving. Also Wire of any shape made to order.

WIRE MILL, 39 Oliver St., Newark, N. J.



JAS. CLAYTON,

Manufacturer of

Water, Air, and Vacuum Pumps and Air Compressors.

Send for Illustrated Circulars.

14 & 16 Water St., Brooklyn, N. Y.

SAMUEL PARKER & CO., Wethersfield, Conn.,

WEAVERS OF

BRASS COPPER, STEEL AND IRON WIRE CLOTH,

and Manufacturers of

Steel Casting Brushes, Steel Flue Brushes and Brooms,

Plain and Landscape Wire Window Screen Cloth a specialty.

STEEL SPARK CLOTH

and all heavy grades of Wire Cloth for

COAL SCREENS, WINDOW GUARDS, &c.

Brass, Iron, Steel and Galvanized Riddles, Wire Flower Stands and Baskets.

Steel Casting Brush.

New York Agency,

PATTERSON BROS., Park Row, N. Y.

RUSSIA SHEET IRON,

Perfect and No. 1 Stained, in Store and for sale at lowest rates by

A. A. THOMSON & CO., 213 & 215 Water St., NEW YORK.

Trenton Vise & Tool Works,

TRENTON, N. J.

Manufacturers of

Solid Box Vises,

HAMMERS, SLEDGES, PICKS,

Mattocks, Grub Hoes, Etc.

WAREHOUSE 101 and 103 Duane Street, N. Y.

HERMANN BOKER & CO.,

Our Vises are warranted to do more work than any other make. No broken boxes or screws.

F. STURGES & CO.,

Sole Manufacturers of

"The Faultless Fruit Can"

And **TRIMMINGS** for same. Manufacturers of

Tinned, Stamped and Japanned

WARES.

Toilet Ware, Bath Tubs, Water Coolers,

Tea Cans, Canisters, Caddies, Etc., Etc.

REFRIGERATORS, ICE BOXES, BIRD CAGES.

Agents for the

WHITE MOUNTAIN FREEZER.

72, 74 and 76 Lake Street, Chicago.

SILVER MEDAL.

AWARDED NOV. 21, 1874

This compound is manufactured under the inventor's personal supervision, and is sold and warranted genuine under the above trade mark, in 1, 5, 10, 50 and 100 lb. packages. Price for 1 lb., 40 cents; for 5 and 10 lb. packages, 30 cents per lb.; for 50 and 100 lb. packages, 25 cents per lb. Samples sent on order. Pound packages can be had of all the principal hardware dealers in the United States and Canada.

The advertiser respectfully refers to the following establishments in which his welding compound is exclusively used: TERWILLIGER & Co., Safe Makers, New York; TRENTON VISE & TOOL WORKS, Trenton, N. J.; BENJ. ATHA & Co., Newark Steel Works, Newark, N. J.; CYRUS CURRIER & Co., Engine Builders, Newark, N. J.; JERSEY CITY STEEL WORKS, J. R. Thompson & Co., Jersey City, N. J.; GRANT LOCOMOTIVE WORKS, Paterson, N. J.; DELAMATER IRON WORKS, N. Y.; D. G. GAUTIER & Co., Jersey City, N. J.; JAMES MOORE, Bush Hill Iron Works, Philadelphia, Pa.; THE CRANE IRON WORKS, Catasauqua, Pa.; S. S. POLLARD, 141 Raymond Street, Brooklyn, N. Y.; W. H. WORTHEN, Supt. Morris Co. Iron and Machine Co., Dover, N. J.; and J. L. H. MOSIER, with Brewster & Co., of Broome Street, New York. UNION Iron Co., Buffalo, N. Y.

H. SCHIERLOH,

24 Exchange Place, Jersey City, N. J.

AGENTS:

WYETH & BRO., Baltimore, Md.
PANCOAST & MAULE, Philadelphia, Pa.
CYRUS CURRIER, Newark, N. J.
R. POTT, 130 Smithfield St., Pittsburgh, Pa.
W. W. KER, 59 Dearborn St., Chicago, Ills.
H. C. JENKINS, Union Iron Co., Buffalo, N. Y.
F. A. & A. M. SMALL & CO., Boston, Mass.
CONGDON, CARPENTER & Co., Providence, R. I.
H. R. IVES & CO., Montreal.

O. LINDEMANN & CO.,

Manufacturers of

JAPANNED AND PATENT BRIGHT METAL

Bird Cages.

Dates of our Patents:

September 3d, 1861.
October 4th, 1870.
August 29th, 1871.
November 7th, 1871.
January 2d, 1872.
March 12th, 1872.
February 4th, 1873.
November 17th, 1874.
December 8th, 1874.
Re-issue, October 29th, 1874.
and January 12th, 1875.

Office and Salesroom,
No. 254 Pearl Street
Factory,
Nos. 252, 254 & 256 Pearl Street,
NEW YORK.

CHARLES E. LITTLE, 59 Fulton St., N. Y.

MECHANICS' AND MACHINIST TOOLS,

COOPERS' TOOLS & TRUSS HOOPS a specialty.

Slaters' and Coach Makers' Tools.

Solid Cast Steel Pump Auger

Agent for Merchant's Improved **Dowelling Machines.**

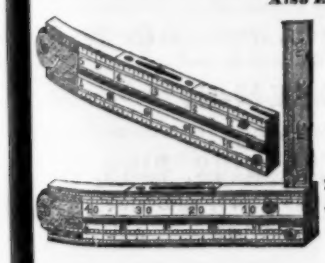
Any one in the trade not receiving my new Price List will please inform me.

STEPHENS & CO.,

Manufacturers of

U. S. Standard Boxwood and Ivory RULES.

Also Exclusive Manufacturers of



L. C. STEPHENS' PATENT COMBINATION

RULE.

Riverton, - - - - Conn.

Boxwood and Ivory Rules having been our **specialty** for over twenty years, we guarantee the uniform excellence which has always characterized our goods.

Price Lists on application.

FISHING TACKLE.

A. B. SHIPLEY & SON,

503 & 505 Commerce Street, Philadelphia.

Manufacturers of

Chalk and Fishing Lines,

FINE BASS AND TROUT FLY RODS.

The celebrated **Greenheart Wood** a specialty.

FINE ROD MOUNTINGS.

Full line of Tackle for Brook, River and Sea Fishing. Agents for **Jno. James & Sons'** celebrated **Fish Hooks and Needles.** Illustrated Catalogues mailed to the trade on application. Silver Medal awarded by the Franklin Institute 1874, "for superior quality and finish of Rods and Tackle."

Buffalo Hardware Co.,

Manufacturers of

GARRETSON'S

Patent Blind and Gate Hinges, Axle Pulleys, &c., &c.

OFFICE AND WORKS,

Cor. Terrace and Henry Streets,

BUFFALO, N. Y.

Send for our Illustrated Catalogue.

PAT. DEC 23, 73
BLAKEMORES GRAVITY DOOR ALARM
USE NO SPRING

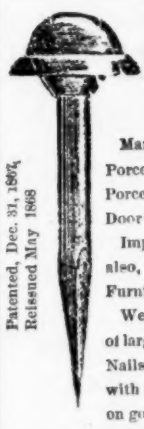
MANUFACTURED 3425 MARKET ST. PHILA PA
SEND FOR CIRCULAR

RIGHT OR LEFT HAND, SURFACE GATE HINGE & LATCH.

SHEPARD'S PATENTS NEW SURFACE GATE HINGE & LATCH TO SWING BOTH WAYS.

DOUBLE LOCKING BLIND HINGE.
"STANDARD" BLIND HINGE.
ALL EXTRA HEAVY PATTERNS.

JNO. D. SHEPARD MANUFACTURER BUFFALO, N.Y.



THE RICHARDS

Hardware Co.,

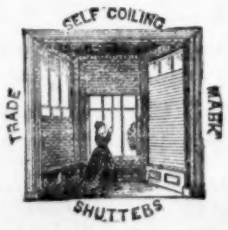
47 Murray Street, N. Y.,

Manufacturers of Richards' Patent Porcelain-head Picture Nails; also, Porcelain Picture, Drawer, Shutter, and Door Knobs, etc., etc.

Importers of German Brass Goods, also, China, Gilt, Steel, and Silvered Furniture Nails Wire Nails etc., etc.

We particularly invite the attention of large buyers to our Patent Picture Nails and Knobs being a specialty with us, we offer satisfactory discounts on good orders.

NO MACHINERY, Cannot get out of Order.



ABSOLUTE PROTECTION, Simplicity of Action.

CLARK & CO.'S

PATENT

Self-Coiling, Revolving

STEEL SHUTTERS

FOR

Store Fronts & Rear Windows.

FIRE AND BURGLAR PROOF

Also, SELF-COILING

Wood Shutters

In various kinds of wood, suitable for Store Fronts, Private Houses, Offices, and School Partitions.

The Best & Cheapest Shutters in the World.

All Real Estate owners are invited to inspect them at the factory,

218 West 26th Street, New York.

JAS. G. WILSON, Manager.

Chicago Office, **54 La Salle Street.**

Sound Castings.

To obtain good and sound castings, in all cases, and under all circumstances, is the chief engrossing care of all founders. There are, of course, many established rules and forms of procedure, gathered from the experience of many years, that generally serve the founder to a sufficient extent to obtain good castings, as a rule, and to make "wasters" the exception.

We believe, however, that if such thoroughly practical men were to add a precise knowledge of what may be supposed to be taking place, in and out of the mold, the proportion of bad castings would be much reduced. It is not only the castings which—broken or blown in the molds—cannot possibly be used that ought to be included under the head of unsound castings. There are, throughout the whole range of castings, delivered apparently sound and complete from the foundry, a considerable portion in which it is only a question of time as to how long they will hold together. It is notorious that the greater proportion of breakdowns in fly-wheels, castings in motion, or castings under pressure, are occasioned by some inherent defect or liability to break in the casting itself, since the broken section is frequently of much more than the requisite area to resist any possible strain that can have occured. These are the unsound castings of which we would warn both purchasers and producers.

As to the unsoundness of castings produced by blow-holes or scum, this is usually patent to the eye of the founder, at least, though not always to that of the customer, after being puttied up, and can be tested by the blows of a small hammer upon any surface whose soundness may be suspected.

The tendency to form blow-holes is well understood among founders and may be caused in two ways: either by the imprisonment of the air originally contained in the mold, or by the generation of steam or gases from the sides of the mold and core. It is surprising how little power of reasoning from cause to effect there is as a rule among practical men, to whom both the cause and the effect may be perfectly plain and patent. Given a case where a casting is produced covered in places with blow-holes, the causes of the effects may be accurately defined. In the first place these blow holes are produced by the presence of a gaseous body displacing the metal. There are then two possibilities—either this gas is the legitimate air which has not been allowed to escape, or it is a further accumulation of steam or gas generated from the mold; neither of these possibilities should have existed. In the first place, any possible air pocket in the mold should be thoroughly ventilated by an escape air hole, and whilst the metal is being poured at one runner, the air should be allowed to escape elsewhere. In the second place, the mold and cores should be so thoroughly dry as to prevent the formation of steam; and further, their composition should be so carefully selected as to preclude the employment of materials liable to burn or to generate much gas. The ventilation from the cores should be specially looked to, as they are generally found to become damp after running the metal, even when thoroughly dried. In the case of large castings a great deal depends on the open and porous nature of the mold bed. If, then, the following points are always rigidly looked to, there should be little fear at any time of a porous or air-blown casting. 1. That whilst the metal is being poured at any runner, there should be free egress for the imprisoned air through another exit. 2. That all pockets or high portions of the mold should have separate additional air escape. 3. That the mold and core be thoroughly dry to prevent the evolution of steam as much as possible. 4. That the materials forming the mold and cores should be already burnt, so as not to give off gases with readiness on contact with the molten metal. 5. That where the casting is long and has a double surface, one above the other, an infinitely better casting may more readily be obtained by casting the same with its length considerably inclined from the horizontal, and pour on to the lower face first, or placed vertically and run with a head. A very frequent cause of the generation of an excessive quantity of gas in a mold is the mixture of too much coal dust and slack in the mold, and using the sand too wet for facility in molding.

The formation, however, of blow holes in castings is but one of the minor evils to which castings are heirs, and this principally because the results are so evident and plain to be seen. One of the most dangerous periods in the life of a casting is the cooling, when the contraction of the various parts in the mold is setting in. And we fear that the general principles, and laws of this shrinking are but little understood or appreciated even by founders themselves. It is, of course, an evident fact that many forms of castings will obstinately persist in parting during the shrinkage, but the simplicity of the laws causing this breakage is, we believe, but little realized.

The whole danger lies in the shrinking not taking place simultaneously. Given a casting of any complexity of form, there cannot be the slightest danger of breakage from shrinkage if the cooling throughout takes place simultaneously, and if the cores will give to the contraction. This latter necessary quality of the cores should be carefully seen to, as evidently, if the cores will not give, the casting must burst under the contracting strain. There is, however, great danger to the casting, when the cooling is not simultaneous, of many portions being placed under great tension, even to such an extent as to cause them to part. Now this simultaneous rate of cooling is very seldom to be obtained naturally in any casting. In a very great proportion of castings the sections of metal are by no means equal throughout, and even if they are, the inner portions of the casting are not able to radiate their heat away with the same facility as the outer ones. The rate of cooling is primarily dependent on the proportion of the outside cooling surface to the mass of the interior metal in any portion. The regularity of this proportion is one of the most essential points that should have the consideration of the designer. This is too often neglected, since the design is frequently made by men or youths unacquainted with the laws of cooling and contraction. But very often it is impossible to design the casting with equal masses of metal throughout, and then the rate of cooling will be inversely proportional to the relative areas of the sections compared with their perimeters. The rate of cooling will also, secondarily, depend on its position—whether surrounded by or in close proximity with other metal, or whether to the outside of the mold.

The success or soundness of a casting under contraction is, then, dependent in the first place on the designer, that all parts should, as far as possible, be of even proportion as to their mass and perimeter, and where this is impossible the responsibility will devolve upon the founder, who must, by artificial accelerated cooling by early uncovering, or by retarded cooling by hot plates, endeavor to produce a simultaneous rate of cooling throughout the casting.

There is still another most useful precaution in the hands of the designer, and that is to evade the disastrous effects of irregular contraction. We will now explain what may be considered to take place, during cooling in the mold, in a very common instance, that of a rigger. The outside face of a rigger is usually of very slight section, and being situated to the outside of the mold is in peculiarly favorable circumstances for rapid cooling. The rim will thus cool and contract much the first, whilst the arms and boss are still hot, the arms being slightly compressed to permit the shrinkage of the rim. When the arms and boss are then cooled and contract, the rim is already set and rigid, and cannot give to the contraction of the arms. These latter, then, being put under high tension, will probably part, as is generally seen to be the case in straight armed riggers; each double arm, forming a diameter, having parted on one side or the other. This is a perfectly simple course of action under the natural laws, and is the key to ninety-nine out of a hundred unexpected breakages of castings, under slight strain. For in some instances, where the difference in time of cooling is but slight, and the section of metal strong, the contraction does not always produce breakage in the mold, but the castings are delivered, apparently sound, until subjected to a slight strain or sudden jar; when the already severely strained portions at once break, long before the normal breaking strain is reached. This peculiar danger of portions of the casting being, though apparently sound, yet under abnormal tension, may be well illustrated by the two following cases. A square plate of thin section, with a heavy boss in the middle, was taken out of the sand apparently sound, and placed till wanted in a yard. After some little time had elapsed it was found to have split spontaneously right across the center, and it was noticed that the slit was widest across the central boss, or strongest part, and scarcely reached to the outside edges, or weakest parts. Now this apparent paradox may be easily explained by reference to the above instance of the rigger, the action being exactly the same. The outside of the plate, offering large surface and small section, cooled much sooner than the heavy central boss and internal portion of the plate. The outside of the plate having thus taken its set compressing the liquid or hot metal within by contracting, offers a perfectly rigid resistance to the after contraction of the boss and center. The outside and center were thus straining against one another in opposite directions, not being able at first to part, but at last doing so under the influence, probably, of the expansion and contraction caused in it by the weather. The use of this foundation plate might thus have seriously endangered the safety of some structure or crane for which it was doubtless intended. The other instance is that of a circular valve box, with intermediate floor, carrying four valves; in this casting the metal floor supporting the valve seats, four in number, formed two diametric ties between the surrounding wall of the box, exactly similar in principle to the arms of the above mentioned rigger. Here the same consequences may be traced. The outer wall first cools and sets the valve floor afterward; but the outer wall being already set cannot give to this after contraction, so that the valve floor will thus be placed under great tension. This fact was well evidenced by the behavior of the castings. In some cases the castings broke in the mold, in others they broke spontaneously, whilst lying in the yard; again, in other cases, after they had been placed to their work, the shock of the valves soon deciding the fracture. In all cases the fractures took place in the smallest sections of the transverse ties, one in each tie.

Although such breakages as we have already pointed out may be, in great measure, obviated by the founder's proper attention to obtain simultaneous cooling throughout the casting, for, in such cases, all parts will contract *pari passu*, and no tendency to part should occur—yet it is almost safer for the designer, where possible, to make the safety of the casting independent of the attention of the founder. This may be done by never designing a diametrical tie the shortest distance between the two circumferential points. This is effected in riggers by making the arms of S shape; so that, when the after contraction of the arms sets in, the arms are able to give to the contraction, by flattening their arcs and thus becoming a shorter length over all without parting. This principle was afterward applied with every success to the above valve-box, by arching the valve floor. The intelligent consideration of these very simple laws of the contraction of castings in cooling, under all their varieties of form, is well worth the earnest attention of designers and founders.—*Iron.*

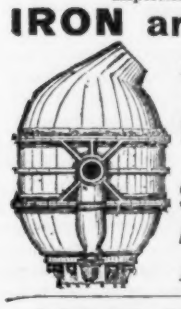
Iron.

NEW YORK.

OGDEN & WALLACE,
Successors to GAM'L G. SMITH & CO.,
IRON WAREHOUSE,
85, 87, 89 and 91 Elm Street, New York.,
(One block below Canal Street.)
Importers and Dealers in
IRON AND STEEL,
Common & Refined Bar Iron,
SHEET AND PLATE IRON,
Rod, Hoop, Band, Scroll, Horse Shoe, Angle and Tee Iron,
PIG IRON, OLD RAILS,
WROUGHT IRON BEAMS.
Iron of all sizes and shapes made to order.

PIERSON & CO.,
Established 1790,
24 & 26 Broadway, 77 & 79 New St.
NEW YORK CITY,
Ulster Iron.
All sizes and shapes kept in stock.

JACKSON & CHACE,
206 & 208 Franklin St., N. Y.,
Importers and Dealers in
IRON and STEEL.
Agents for
JOHN A. GRISWOLD & CO'S
Bessemer Steel.
MACHINERY STEEL,
Cast Steel and
SPRING STEEL,
ANGLE and T IRON.
Special Irons for Bridge and Architectural Work.



ABEEL BROTHERS,
Established 1765 by ABEEL & STYVANCE.
Iron Merchants,
190 South Street and 365 Water, N. Y.
ULSTER IRON
A full assortment of all sizes constantly on hand.
Refined Iron,
Horse-Shoe Iron,
Common Iron.
Band, Hoop and Scroll Iron.
Sheet Iron.
Norway Nail Rods.
Norway Shapes.
Cast, Spring and Tire Steel, etc.

A. R. WHITNEY. J. HENRY WHITNEY.
A. R. Whitney & Bro.,
Manufacturers of and Dealers in
IRON,
56, 58 & 60 Hudson,
48, 50 & 52 Thomas, and
12, 14 & 16 Worth Sts.,
NEW YORK.
Our specialty is in
Manufacturing Iron
Used in the Construction of
Fire-Proof Buildings, Bridges, &c.
AGENCY OF
Abbott Iron Co. Boiler Plate & Tank Iron.
Glasgow Tube Works Boiler Flues.
Penceyd Iron Works Shafting.
Passaic Rolling Mill Angles and Tees.
A. R. Whitney & Bro.'s Rivets.
Whitney's Best Bar Iron.
Passaic Rolling Mill Wrought Iron Beams and Channel Iron.
Paxton Rolling Mills.
Books containing Cuts of all Iron now made, and Sample Pieces at office. Please address 58 Hudson Street.

BORDEN & LOVELL,
Commission Merchants
70 & 71 West St.,
Wm. Borden, L. N. Lovell, — New York.
Agents for the sale of
Fall River Iron Co.'s Nails, Bands, Hoops & Rods,
AND
Borden Mining Company's Cumberland Coals.

WILLIAM H. WALLACE & CO.,
IRON MERCHANTS
Cor. Albany & Washington Sts.,
NEW YORK CITY.
WM H. WALLACE. WM. BISPHAM.

Iron.

NEW YORK.

C. HUERSTEL,
(Successor to CONKLIN & HUERSTEL.)
IRON AND STEEL.
WAREHOUSE,
99 Market Slip, N. Y.
IRON and STEEL of all kinds
Constantly on Hand.
Horse Shoe Iron & Nails, Norway Iron, Cast, Spring, Toe Calk, & Bessemer Steel Tire.
Also, SPRINGS, AXLES and BOLTS,
For Truck and Carriage Makers.

WM. GARDNER'S SONS.
SUCCESSORS TO WM. GARDNER,
575 Grand, 414 Madison & 309 Monroe Sts.
Bar, Hoop, Rod, Band and A. W. Horse Shoe Iron.
NORWAY NAIL RODS AND SHAPES.
Spring, Toe Calk, Tire & Sleigh Shoe Steel.
Manufacturers and Proprietors of
PATENT BOLT HEADER.

A. B. Warner & Son,
IRON MERCHANTS,
28 & 29 West and 52 Washington Sts.
BOILER PLATE,
Boiler Tubes, Angle, Tee & Girder Iron,
Boiler and Tank Rivets.
Sole Agents for the celebrated
"Eureka," Pennocks,
"Wawasset," Lukens,
Brands of Iron. Also all descriptions of Plate, Sheet, and Gasometer Iron. Special attention to Locomotive Iron. Fire Box Iron a specialty.

Geo. A. Boynton,
BROKER IN IRON
70 WALL ST, N.Y.

POWERVILLE
ROLLING MILL,
JOHN LEONARD,
450 & 451 West Street, NEW YORK.
Manufacturer of all sizes of MERCHANT IRON and HOOPS. Also Manufacturer of
Best Charcoal Scrap Blooms.
And Dealer in Old and New Iron.

Marshall Lefferts, Jr.,
90 Beekman St., New York,
MANUFACTURER OF
AMERICAN
Galvanized Sheet Iron,
AND AGENT FOR THE
Easton Sheet Iron Works, Easton Pa.
MANUFACTURER OF
Best Bloom, Charcoal & Refined Sheet Iron.
Galvanized Telegraph and Fence Wire
Galvanized and Tinned Roofing and Slating Nails.
Galvanized Hoop Iron of all widths.
Galvanized Staples.
Corrugated Iron for Roofing, plain or gal'd.
Galvanized Bars and Chains for Cemetry Railing.
Tin Plates, Spelter, and other Metals.

NORWAY IRON WORKS.
Spring, Tire, Toe Calk & Sleigh Shoe Steel.
BLISTER STEEL,
SCRAP RODS,
3-16, 1-4 and 5-16 Round and Square.
Norway Shapes & Nail Rods,
Etc., Etc. Address,
NAYLOR & CO.
New York, Boston or Philadelphia.

P. W. GALLAUDET.
Banker and Note Broker,
Nos. 3 and 5 Wall Street,
NEW YORK.
HARDWARE, METAL, IRON, RUBBER, SHOE, PAPER AND PAPER-HANGINGS, LUMBER, COAL AND RAILROAD PAPER WANTED.
ADVANCES MADE ON BUSINESS PAPER AND OTHER SECURITIES.

HOLDEN, HOPKINS & STOKES, IRON, CAST STEEL, NAILS, RAILS, & R.R. SPIKES, 104-106 John St. NEW YORK.

Iron.

NEW YORK.

T. D. HAZARD,
Successor to HAZARD & JONES,)
IRON IN
NEW & OLD RAILS,
Foreign and Domestic
PIG IRON,
Wrought and Cast Scrap Iron
AND GENERAL METALS.
204 Pearl St., New York.

JAMES WILLIAMSON & CO.,
SCOTCH AND AMERICAN
PIG IRON,
No. 69 Wall St.. New York.

U. O. CRANE.
BROKER IN
PIG IRON & METALS,
104 John St. New York.

JOHN W. QUINCY,
98 William Street, New York
Dealer in
Anthracite & Charcoal Pig Irons,
OLD SCRAP and CUT NAILS.
Gibbs' Patent Lock Nut and Washer, and Fish Plates for Rail Roads.

BOONTON
CUT NAILS,
HOT PRESSED NUTS,
Machine Forged Bolts,
Washers.
Fuller, Lord & Co.,
BOONTON IRON WORKS,
139 Greenwich Street. New York.

Swedish Iron.
A Variety of Brands, including
UB HP NB 03
BARS suitable for Steel of all grades, Wire, Shovels, Hoes, Scythes, Carriage Bolts, Nail Rods, Tacks, &c.
CHARCOAL PIG IRON for Bessemer and Car Wheels.
MUCK BARS for Steel Smelting and Re-rolling.
SCRAP or BAR ENDS.
Direct Agency for N. M. HÖGLUND, of Stockholm, represented in the United States by
NILS MITANDER,
69 William St., New York.
ABBOTT & HOWARD, Boston, Mass. AGENTS: ALBERT POTTS, Philadelphia, Pa.

DANIEL W. RICHARDS & CO.,
Importers of and Dealers in
SCRAP IRON,
Pig Iron,
OLD METALS.
YARDS:
88 to 104 Mangin St., 71 to 79 Tompkins St. } Foot of Stanton St., E. R., New York.
OFFICES.
90 & 92 Mangin Street, 178 Pearl Street, 30 The Albany, Liverpool, England. } New York.

B. F. JUDSON,
Importer of and Dealer in
SCOTCH AND AMERICAN
Pig Iron,
Wrought & Cast Scrap Iron,
English and American
HORSE SHOE IRON, &c.,
457 & 459 Water St., and 235 South St., NEW YORK.

REYNOLDS & CO.,
145 EAST STREET, NEW HAVEN, CT.,
Manufacture
Iron and Steel Set Screws, Round, Square and Hexagon Head; Machine and Cap Screws; Piano, Knob and Lock Screws; Machine, Bridge and Roof Bolts, Bolt Ends, Blanks, Nuts, Washers, etc., of every description.
Send for Price List.

MANGANESE.
To Glass and Steel Manufacturers, Varnish Makers and others we offer our brands of Manganese, which have become well known to consumers during the past eighteen years as the most reliable in the market.
All Manganese sold by us is the production of our own mines in New Brunswick, and the greatest care is used in selecting the ore and grinding it for use. Our AA brand for Flint Glass is unequalled in quality, and our other brands are especially adapted for the purposes for which they are offered.
HOBBS, POPE & CO.,
35 India Street, BOSTON.
AGENTS, NEW YORK, JOHN S. LAMSON & BRO.
AGENTS, PITTSBURGH, PA., GEO. COLHOUN & SON.

Iron.

NEW YORK.

HARRISON & GILLOON
IRON AND METAL DEALERS,
558, 560, 562 WATER ST., and 302, 304, 306 CHERRY ST.,
NEW YORK,
have on hand, and offer for sale, the following:
Scotch and American Pig Iron, Wrought, Cast and Machinery Scrap Iron, Car-Wheels, Axles and Heavy Wrought Iron; also old Copper, Composition, Brass, Lead, Pewter, Zinc, &c.

PETTEE & MANN,
Dealers in
Ulster, English Refined & Common
BAR IRON,
Scotch and American Pig Iron, Wrought & Cast Scrap Iron, &c., &c.,
228 & 229 South and 449 & 451 Water Sts., N. Y.
The highest price paid for Wrought and Cast Scrap Iron. Storage for Pig, Bar and Railroad Iron taken at the lowest rates.
D. L. PETTEE. G. A. MANN

OXFORD IRON CO.,
Cut Nails and Spikes,
R. R. Spikes, Splice Bars and Nuts and Bolts,
81, 83 & 85 Washington, near Rector St, N. Y.
JAMES S. SCRANTON, Agent.

HENRY CONKLIN,
(Late of the Firm of Conklin & Huerstel.)
Commission Merchant in
IRON and STEEL,
SCRAP IRON BOUGHT AND SOLD.
Horse Shoe Iron a specialty.
212 Broadway, N. Y., (Room 4)

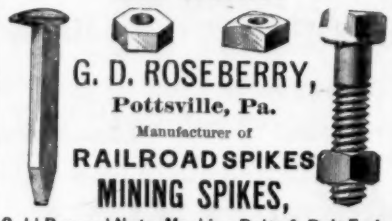
DAVID CARPENTER,
Manufacturer of
HOT PRESSED NUTS,
And Dealer in
All kinds of Refined Bar & Horse Shoe Iron,
402 Water Street, New York.

J. C. LEFFERTS,
Metal Broker,
PIG, RAILROAD & SCRAP IRON
241 PEARL STREET, NEW YORK.

ESTABLISHED 1840.
PETER TIMMES' SON,
Manufacturer and Galvanizer of
Wrought, Ship, Boat, Dock & R. R.
SPIKES, RIVETS, NAILS, &c.
Nos. 281, 283 & 285 N. 6th St.,
Near junction of N. 2d St., Brooklyn, E. D.

BURDEN'S
HORSE SHOES.
"Burden Best"
Iron.
Boiler Rivets.
Burden Iron Works, H. Burden & Sons
Troy, N. Y.

Pottsville Spike, Bolt and Nut Works.



G. D. ROSEBERRY,
Pottsville, Pa.
Manufacturer of
RAILROAD SPIKES
MINING SPIKES,
Cold Pressed Nuts, Machine Bolts & Bolt Ends.

Girard Rolling Mill Co.,
Manufacturers of
MERCHANT BAR IRON
AND T RAIL,
Nuts, Washers,
Collar, Machine and Bridge Bolts,
Patent Car Coupling Links & Pins.
Girard, Ohio.

Iron.

PITTSBURGH.

Pittsburgh Foundry.
A. GARRISON & CO.,
Manufacturers of
CHILLED AND SAND ROLLS,
Of acknowledged superior quality, at the lowest current prices.
Ore and Clay Crushers, and Rolling Mill Castings,
of every description.
Office, No. 33 Wood St., cor. of 2d Ave.
PITTSBURGH, PA.

PENNSYLVANIA IRON WORKS.
EVERSON, MACRUM & CO.,
Pittsburgh, Pa.,
Manufacturers of every description of
Bar, Sheet and Small Iron,
Make a specialty in
Fine and Common Sheet Iron.

W. P. TOWNSEND & CO.,
Manufacturers of
WIRE and Black and Tinned Rivets
OF CHOICEST CHARCOAL IRON.
Rivets any diameter up to 7-16inch and ANY LENGTH required.
19 & 21 Market St., PITTSBURGH PA.

A. G. HATRY,
Manufacturers' Agent and Broker.
Bar, Sheet, Tank, Boiler, Angle, T, and Railroad Iron,
Nails & Spikes, Steel & R. R. Supplies.
PITTSBURGH, PA.

SHOENBERGER & CO.
Manufacturers of
CUT NAILS,
AND
Spikes,
HORSE AND MULE SHOES,
Horse Shoe Bar, &
SHEET IRON.
Goods warranted equal to any in the Market. Send for Circulars in regard to "PICKED NAILS."
PITTSBURGH, PA.

Boston Rolling Mills
Manufacture extra quality small Rods, from best selected Scrap Iron.
Swedish and Norway Shapes,
NAIL and WIRE RODS.
Also HORSE SHOE IRON.
BOSTON ROLLING MILLS,
W. R. ELLIS, Treasurer.
Office, 17 Batterymarch St., Boston

"PEMBROKE"
Round, Square & Flat Iron.
"FRANCONIA" Shafting & Bar Iron.
Extra quality when great strain or superior finish is required. Also, Irons for ordinary work, like the "ENGLISH REFINED."
WM. E. COFFIN & CO.,
No. 8 Oliver Street, Boston.
New York Agents,
JEVONS STROUD & CO., 104 John St., N. Y.

ASA SNYDER,
Importer of Scotch, and Furnace Agent for the celebrated Antnracite and Hot and Cold Blast Charcoal
PIG IRONS.
OFFICE AND YARD:
1008, 1010, 1012 and 1014 Cary Street, Richmond, Va.
Orders for Scrap Iron filled.

L. S. TAYLOR. WM. MITCHELL. C. H. POND
TAYLOR, MITCHELL & POND,
Manufacturers of
MERCHANT IRON
And Light T Rail.
Massillon, Ohio.

PACKARD, GOFF & CO.
Youngstown, O.
Manufacturers of
Merchant Bar Iron.
Mills at Hubbard, O.; also Jobbers in
Nails, Nuts, Washers & Carriage Bolts.

COLEMAN & BRO.
Manufacturers' Agents and Brokers
PIG IRON, NAILS, RAILS, NUTS,
WASHERS, and General
Railroad Supplies. LOUISVILLE, KY.

Iron.

PHILADELPHIA.

Iron and Steel T and Street Rails

Of Best American and English Makes.

CHAIRS, SPIKES, FISH BARS, RAILROAD SUPPLIES.

Muck Bars, OLD RAILS, Scrap, BLOOMS.

American and Scotch

PIG IRON, AND METALS.

CHAS. W. MATTHEWS,

133 Walnut St., Phila.

[Late RALSTON & MATTHEWS, 133 Walnut St.]

MALIN BROS.,

IRON

Commission Merchants,

No. 228 Dock Street,

3d door below Walnut, PHILADELPHIA.

H. L. GREGG & CO.,

Ship Brokers & Commission Merchants,

Importers of

Old Iron, Metals and Rags.

Freight engagements made to all parts of the world. Marine insurance effected in reliable offices.

108 Walnut St., Phila.

JUSTICE COX, Jr. & CO.,

Iron Commission Merchants.

Foundry and Forge Pig Iron, New and Old Rails, Muck Bar, Scrap, &c.

No. 333 Walnut Street, PHILADELPHIA.

THE CAMBRIA IRON WORKS,

Situated on the line of the Pennsylvania Rail Road, at the western base of the Alleghany Mountains, are the largest of their class in the United States, and are now prepared to make

1800 TONS PER WEEK,

Of Iron and Steel Railway Bars.

The Company possesses inexhaustible mines of Coal and Ore, of suitable varieties for the production of Iron and Steel Rails of

BEST QUALITY.

Their location, coupled with every known improvement in machinery and process of manufacture enable them to offer Rails, when quality is considered, at lowest market rates.

The long experience of the present Managers, of the Company, and the enviable reputation they have established for "CAMBRIA RAILS," are deemed a sufficient guarantee that purchasers can, at all times depend upon receiving rails unsurpassed for strength and wear by any others of American or foreign make. Any of the usual patterns of rails can be supplied on short notice, and new paterns of desirable weight or design will be made to order. Address,

CAMBRIA IRON COMPANY

218 S. Fourth St., PHILADELPHIA.

Or at the works, JOHNSTOWN, PA.

The Phœnix Iron Co.,

410 Walnut St., Philadelphia.

MANUFACTURERS OF

CURVED, STRAIGHT AND HIPPED

Wrought Iron Roof Trusses

BEAMS, GIRDERS, AND JOISTS,

and all kinds of Iron Framing used in the construction of Iron Proof Buildings.

Deck Beams, Channel, Angle and T Bars

Curved to template, largely used in the construction of Iron Vessels.

Flat, Wrought Iron Columns, Weldless Eye Bars,

for Top and Bottom Chords of Bridges.

Railroad Iron, Street Rails, Rail Joints and Wrought Iron Chairs.

Turned Bar, Shafting, and every variety of Shape Iron made to order.

Plans and Specifications furnished. Address

SAMUEL J. REEVES Vice Pres.

Iron.

PHILADELPHIA.

W. GRAHAM HOOPES

Commission Merchant

FOR THE SALE OF

Pig, Bloom, Plate, Bar & Railroad

IRON,

No. 419 Walnut Street, Philadelphia.

PETER P. PARROTT,

Manufacturer of the

"CLOVE"

ANTHRACITE PIG

IRON.

At Greenwood Iron Works,

ORANGE CO., N. Y.

Warren Spike Works.

G. W. FAHRION,

Manufacturer of

Railroad, Ship and Boat

SPIKES,

All Shapes and Sizes, Black and Galvanized.

Warren, Ohio.

Spooner & Collins,

COMMISSION AGENTS,

PIG IRON

Blooms, Bar, Sheet & Hoop Iron.

409 N. Third St., (Room No. 6). St. Louis.

Bonnell, Botsford & Co.,

Iron, Nails & Spikes.

YOUNGSTOWN, OHIO.

Warren Boiler Works,

Phillipsburg, N. J.

Steam Boilers,

Tanks,

Heaters,

Stacks, Pipe,

And all Wrought Iron work made to order.

ESTIMATES GIVEN ON CONTRACT WORK FOR FURNACES AND ROLLING MILLS.

A Liberal Discount on Boilers to Engine Builders.

Prices given on application. Address,

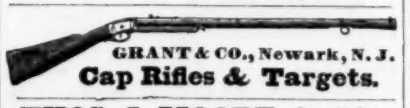
TIPPETT & WOOD.

FLUOR SPAR

In Lump, Crushed, Ground, or extra fine, for sale by pound, barrel, ton or car load, by

SCHWEITZER MFG. CO.,

57 Reade St., N. Y.



GRANT & CO., Newark, N. J.

Cap Rifles & Targets.

THOS. J. MOORE & CO.,

EXCELSIOR

Sash Weight Manufactory

Bedford Ave. cor. Wallabout St., Brook'yn, N. Y.

Large stock constantly on hand of both Solid and Wire Eyed Weights. Orders solicited and promptly filled at lowest market prices.

SPRAGUE SASH WEIGHT CO.,

YOUNGSTOWN, OHIO,

Manufacturers of

SPRAGUE'S IMPROVED

Sectional Sash Weights.

Orders solicited from all parts of the country

The LACKAWANNA IRON & COAL CO.,

SCRANTON, PA.,

(OFFICE IN NEW YORK CITY, 52 WALL STREET,)

MANUFACTURERS OF

BEST QUALITY

RAILROAD IRON,

Forge and Foundry Pig,

BEST DOUBLE-REFINED MERCHANT BAR IRON,

CAR AXLES AND STRAP RAIL.

ORDERS CAN BE FILLED AT ONCE.

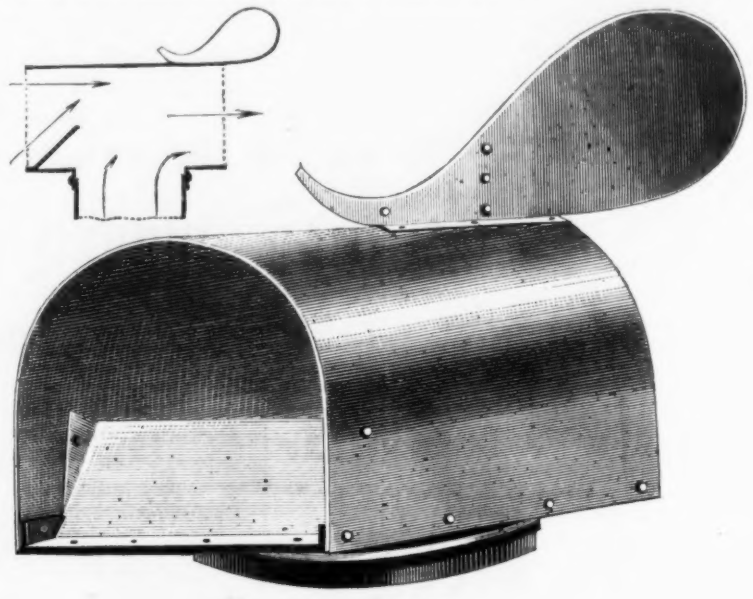
Company's works for manufacturing BESSEMER STEEL RAILS will be completed during the summer of 1875.

New Chimney Cowl.

Smoking chimneys are one of the nuisances of civilization, and smoking fires in general seem to have plagued men from the time when fires were first used till the present day. The ancients complained of them, and their laments and fault-finding over fire places that sent the smoke the wrong way, sound strangely like the letters which frequently come to *The Metal Worker* from our subscribers. For some chimneys we suppose no remedy can be found—yet we think that a large proportion of them may be benefited very much, if not entirely cured. During the past week Mr. John H. Reynolds, of Troy, New York, has brought to our notice the chimney cowl which we illustrate.

The idea embodied in this invention is to create a draught in the chimney by utilizing the power of the wind, and at the same time to prevent the possibility of a wind from any direction reversing or checking the draught. There are many chimneys in which there is no draught at all, either because they do not become warm, and so the air in them is cooled and has a tendency to rise rather than fall, or because cold currents from the outside cool the air within, and so prevent a draught. Beside these, rough inside surfaces and small flues often destroy the draught.

By placing a cowl upon the top of the chimney, downward currents of wind are prevented from stopping the draught, and if the cowl be properly made, the wind may be utilized in creating a draught. This is done by an application of the well-known principle of the injector. The cowl of which we speak consists of a short, semi-circular tube or pipe, at the mouth of which is placed a slanting partition. A current of air passing through the cowl is deflected by this partition, and forms a partial vacuum behind it. Into the vacuum thus created the smoke from the chimney rushes, producing a decided artificial draught, much more powerful than one would at first suppose possible. The small diagram shows a section of the cowl with spindle removed. The arrows show the direction taken by the wind and smoke, the vacuum produced by the outward rush of the air being filled by the smoke coming up from below, as indicated by the arrows.



NEW CHIMNEY COWL.

In order to keep the cowl always face to the wind, it is made to turn upon a spindle, the bearing for which is of glass, in order to reduce the friction as low as possible. A vane is provided to keep the cowl head to the wind.

Saving Life at Sea.

The London *Times* of the 24 instant says: An experiment, which there is good reason to believe may prove something more than a mere experiment, was tried on Monday evening on the Thames, immediately in front of the Houses of Parliament, with what are known at the Admiralty as Holmes' Shipwreck and Distress Signals. The signals are the same as those which two years since were held to have been the most successful in the Northfleet experiments on the Serpentine and on the Mersey. They have, moreover, been tried on board the Challenger, and the trial would seem to have been very satisfactory. It is said that they never failed to light on striking the water, and would keep alight for twenty or thirty minutes, and the opinion of those who made the trial is that they would be extremely valuable for indicating a fixed position at sea, either for marking a danger or for denoting the whereabouts of a life buoy, and that they would be in any case far superior to the light on the service life-buoy. Fortunately for the crew of the Challenger, the report from which we have quoted is unable to furnish us with any information as to the practical result of such a light in the case of a man overboard at night, as no such case occurred; but we have a very clear statement from Capt. Gillon., of the ship Bosphorus, which we may be excused from giving in full: "At 9:30 p. m. on the 7th of August, in lat. 48° N., and long. 32° W., it being a dark night, with a strong wind and heavy sea running, a man named John Rowe, a native of Plymouth, fell from the jibboom into the sea. I heard his voice as he was passing the stern, and hove the Holmes' rescue signal light to the sound, and it at once showed a very bright light.

"The ship at the time was going eleven miles an hour, and of course was a considerable distance from the man before she could be stopped and a boat got out; but through the light pointing out the spot where the man was he was found and received on board in twenty-five minutes; but had there been no light it would have been impossible to save him in such a sea and on such a dark, cloudy night; and, strange to say, though life buoys, oars, gratings, etc., were thrown overboard, none of them were seen by the man in the water nor yet by the eight men who manned the boats. I may say I distinctly saw the light forty-three minutes; it was then three miles off."

It may be said that so far as it was possible to form an opinion from what was to be seen on the Thames last night, the signal lights in question fairly carried out the favorable verdicts pronounced upon them. They were set afloat from a small boat under Westminster bridge about 9:15, wanting about an hour and a half to high water, the night being clear and still, and what little wind there was blowing with the tide, and that could still be seen burning brightly beyond the arches of Lambeth bridge. Under such circumstances it would, of course, be idle to pretend to estimate from yesterday's experience what their value really would be in a strong gale with a heavy sea on; but there can be no doubt that the light they show is not only brilliant, but lasting, and one which, with the report of the Challenger, we would be inclined to say would be useful in indicating a fixed position at sea to those on board, though how far they would serve to show a man in the water what was being done for his aid we are hardly in a position to say.

Compression in Casting.—Col. Uchatius, director of the Arsenal at Vienna, whose name is coupled with a peculiarly fine and tenacious steel made in Sweden, has lately given the results of an exhaustive series of experiments on compressing bronze when in a state of fusion, and otherwise treating so that it acquired many of the properties of steel. With an alloy of 90 per cent. of copper and 10 per cent. of tin, and a pressure of 80 tons, a very hard, tenacious metal was produced, but one with little more elasticity than ordinary bronze. On cold rolling this bronze cast under pressure into an ingot, its power of resistance, its elasticity and hardness were increased. After repeated experiments it was found that an alloy of 92 per cent. of copper and 8 per cent. of tin was the best and most economical. In casting the bronze to produce a homogeneous mass, after repeated and varied trials a double mold with a solid forged copper core 0·05 meter in diameter was decided to be the best. The bronze produced in this manner is declared to have all the hardness, homogeneousness, and power of resistance of steel tubes. Its wearing qualities are as great, and the cost of bronze guns made in this way is much less than steel if the value of the old metal is taken into account.

Lead.

In an article in the San Francisco *Scientific Press*, Mr Henry G. Hanks thus summarizes pretty much all that is known of lead:

Metallic lead has a bluish gray color. It is usually tarnished, in which case it has no luster, but when freshly cut shows a surface highly metallic and brilliant. It is a soft metal, very malleable, easily fusible and volatile at a white heat. It is scarcely acted on by hydrochloric acid or dilute sulphuric acid; but moderately dilute nitric acid dissolves it, more readily if heat is applied.

The presence of lead in any substance containing it may with certainty and ease be determined by heating the sample on a piece of well burned willow charcoal, in one portion of which—nearest the flame—a small cavity or depression has been made, in which the assay may be placed, a little carbonate of soda added and the flame of an oil lamp or large candle turned upon it by means of the mouth blow-pipe. The direction of the flame at first should be downward until the assay begins to melt, after which it should be blown softly and nearly horizontally across the charcoal. If lead is in the assay, a coating will form on the charcoal which is lemon yellow when hot, and sulphur yellow when cold. Other volatile substances which may be present will also form coatings, but they will be distinct, and at distances more remote from the assay, nor will they be the same color. Zinc, like lead, gives a yellow coating, which, to the inexperienced, might lead to mistakes, but if the charcoal is allowed to cool the zinc coating will become white, by which reaction it may be distinguished.

The following are the reagents used in the determination of lead in the wet way, and the reactions which occur:

Hydrosulphuric acid or sulphide of ammonium added to solutions of lead salts gives black precipitates of sulphide of lead which are not soluable in cold dilute acids, alkalies, alkaline sulphides or cyandie of potassium, but the precipitate may be decomposed by boiling nitric acid. The acid must be dilute or a part of the lead will be changed to the sulphate and remain insoluble. Soda, potassa and ammonia throw down basic salts of lead in the form of white precipitates which are insoluble in ammonia. The exception is solution of acetate of lead, from which pure ammonia (free from carbonate) does not immediately produce a precipitate, a soluble triacetate of lead being formed.

Carbonate of soda produces a white precipitate of basic carbonate of lead, when added in solution to the solution of any lead salt. This precipitate is not soluble in excess of the precipitant nor in cyanide of potassium.

Hydrochloric acid, or the soluble chlorides, produce in solutions of the lead salts, if concentrated, a heavy precipitate of chloride of lead, which is soluble in a large quantity of warm water.

Sulphuric acid and sulphates throw down from lead solutions a heavy precipitate of sulphate of lead, which is nearly insoluble in water and dilute acids, but dissolves readily in solution of citrate of ammonia.

Chromate of potassa when added to a solution containing lead throws down a beautiful yellow precipitate of chromate of lead, which dissolves in potassa, but which is nearly insoluble in nitric acid.

It should be understood that the above reagents are in solution, and are to be added in every case to solutions of substances containing lead.

Lead occurs in nature in a variety of forms, but most of the metal furnished to commerce is from galena or sulphuret of lead. Native lead is reported as occurring in globules at Alston Moor, and at the mines near Carthagena, Spain, but never in sufficient quantity to work, or even to furnish specimens for the cabinet of the mineralogist.

Galena, the most abundant ore of lead, has a metallic luster. Its color and streak are pure lead gray. When broken it is still cubic in form, even when reduced to the finest powder. It always contains silver and sometimes selenium, zinc, cadmium, manganese, gold, antimony, copper and iron. Even platinum is said to be found in galena in France.

It is a mistake to suppose that any external appearance indicates the quantity of silver in a sample of galena.

There is a variety of galena which is called supersulphureted lead. The excess of sulphur results from the decomposition of a portion of the galena, setting the sulphur free.

There are several minerals which resemble galena, and may easily be mistaken for it. The most common is micaceous iron, a variety of hematite. The resemblance of this mineral to galena is sometimes so striking as to deceive the inexperienced. It may, however, be distinguished by the following tests: When heated on charcoal it gives off no odor of sulphur, nor can it be fused before the blow pipe. No metallic beads are formed when carbonate of soda is added. After strong heating it becomes red, and on cooling is found to be attractable by the magnet.

Galena in Missouri and Illinois has been extensively worked. The largest deposits in the world are in the Western States, and that ore is there found associated with limestone, blende, carbonate and sulphate of lead, pyrites, and often an ore of copper and cobalt.

The lead region of Wisconsin comprises sixty-two townships, eight in Iowa, ten in Illinois, being eighty-seven miles in diameter, from east to west, and fifty four miles from north to south. Throughout this region there is scarcely a square mile in which traces of lead may not be found. From a single spot not exceeding fifty yards square, three million pounds of ore have been raised, and in one of the townships two men have raised 16,000 pounds in a day. The mines of the upper Mississippi afford about 760,000 pigs annually, and those of Missouri about 150,000 pigs.

In 1874 the production of lead in California more than doubled, while in the same year that of England *decreased* 17,000 tons.

For making white lead Eastern corroders prefer the Missouri lead to any other.

To give the reader some idea of the production of lead in the United States, the following statistics for the year 1874 have been compiled:

	Tons.		Tons.
Missouri	15,000	Chicago	2,200
California	8,000		
Philadelphia			46,550
New York	6,500		
Newark			
Iowa		Imported	18,000
Illinois	5,500	U. S. Sales	4,000
Wisconsin			
Omaha	5,800		68,500
Salt Lake	3,500		

In 1874 the Union Pacific Railroad carried East 3500 tons refined lead and 15,000 tons bullion, by which is meant lead carrying more or less of the precious metals.

Roman Kitchen Utensils.—A paragaph in the *Journal de Geneve* mentions the acquisition by the museum of that town of a set of Roman kitchen utensils found in a field near Martigny, having probably been buried on account of some sudden alarm. There are 30 articles, mostly in bronze, some of them elaborately worked, reminding one of the beautiful shape and ornamentation of Pompeian vessels. The shovel and pot-hanger do not differ much from modern articles, and there is an earthen mold shaped like a shell, several plates in various sizes, a saucepan with the bottom worn away, a large boiler, a funnel, two ladles, a stew pan, and vases, or ewers, with two gladiators, and apparently awarded as a prize. There are also two silver ornaments, seemingly of later date, and believed by Dr. Gosse, the curator, to have been used in Christian worship. He attributes the find to the third century. Three bronze coins were discovered in the same spot, two of them bearing the effigy of Augustus and the third that of Antoninus.

Iron.

CLEVELAND.

CLEVELAND ROLLING MILL CO.,

MANUFACTURERS OF

BESSEMER STEEL RAILS,

Steel Plates and Forgings, Railroad Iron, Merchant Bar, Beams, Girders, Splices, Bolts, Spikes, &c., &c.

Office, Nos. 99 and 101 Water St., CLEVELAND, O.

A. G. STONE, Pres. H. CHISHOLM, V. P. & Gen. Supt.
E. S. PAGE, Sec'y.

Cleveland, Brown & Co.

IMPORTERS, MANUFACTURERS AND DEALERS IN

IRON AND STEEL,

HORSE SHOES, HORSE NAILS,

NORWAY NAIL RODS,

NAILS, SPIKES,

"Standard Taper" Axles & Swedes Iron.

WINDOW GLASS,

Wrought Iron Pipe and Boiler Tubes.

Chains, Rivets, Nuts, Washers, and Heavy Hardware Generally.

25, 27, 29 & 31 Merwin Street,

CLEVELAND, OHIO.

OLD DOMINION
Iron and Nail Works Co.,

RICHMOND, VA.

R. E. BLANKENSHIP, Commercial Agent, Manufacture

NAILS AND BAR IRON.

Bands, Scrolls, Horse Shoe Bars, Nut and Rivet Iron, Spike Rods, Shafting, Bridge Bolts, Ovals, Half Ovals, Half Rounds, &c.

The Iron-Masters'
Laboratory.

Exclusively for the Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags & Coal for Practical Metallurgical Purposes.

No. 339 Walnut Street, Philadelphia.

J. BLODGET BRITTON.

This Laboratory was established in 1866, at the instance of a number of practical Iron-masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for melting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

CHARGES TO IRON WORKS.

For determining the per cent. of Pure Iron in an ordinary Ore	$4 00
For the per cent. of Pure Iron, Sulphur and Phosphorus in do	12 50
For each additional constituent of usual occurrence	1 50
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.	
For determining the per cent. of Sulphur and Phosphorus in Iron or Steel	14 00
For each additional constituent of usual occurrence	6 00
For the per cent. of Carbonate of Lime, and insoluble Silicious Matter in a Limestone	10 00
For each additional constituent	2 00
For the per cent. of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal	12 50
For determining the constituents of a Clay, Slag, Coke, or of an Ash of Coal the charges will correspond with those for the constituents of an ore.	
For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.	
Printed instructions for obtaining proper average samples for analysis furnished upon application.	

SCHOOL OF MINES,

COLUMBIA COLLEGE,

East 49th Street, NEW YORK.

FACULTY:

F. A. P. BARNARD, S. T. D., LL. D., President.
T. EGLESTON, Jr., E. M., Mineralogy and Metallurgy
FRANCIS L. VINTON, E. M., Mining Engineer.
C. F. CHANDLER, Ph. D., Analytical and Applied Chemistry.
JOHN TORREY, M. D., LL. D., Botany.
CHARLES A. JOY, Ph. D., General Chemistry.
WILLIAM G. PECK, LL. D., Mechanics and Mining urveying.
JOHN C. VAN AMRINGE, A. M. Mathematics.
OGDEN N. ROOD, A. M., Physics.
JOHN S. NEWBERRY, M. D., Geology and Palæontology.

The plan of this school embraces a three years' course for the degree of ENGINEER OF MINES, or BATCHELOR OF PHILOSOPHY.

For admission, candidates for a degree must pass an examination in Arithmetic, Algebra, Geometry and Plain Trigonometry. Persons not candidates for degrees are admitted without examination, and may pursue any or all of the subjects taught. The next session begins October 2nd. The examination for admission will be held on June 23rd and September 29th, 1871. For further information and catalogues, apply to

DR. C. F. CHANDLER,
Dean of the Faculty.

MAYNARD & VAN RENSSELAER.

CONSULTING

Mining and Metallurgical

ENGINEERS,

Experts in Iron and Analytical Chemists

26 1-2 Broadway, NEW YORK,

George W Maynard. Schuyler Van Rensselaer.

GEO. W. BRUCE,

No. 1 Platt Street, N. Y.

Has in stock a Full Assortment of

ENGLISH & ATLANTIC SCREWS,

both Iron and Brass, Flat and Round Headed, and begs his friends will inquire from him rather than his competitors as to his ability to supply them.

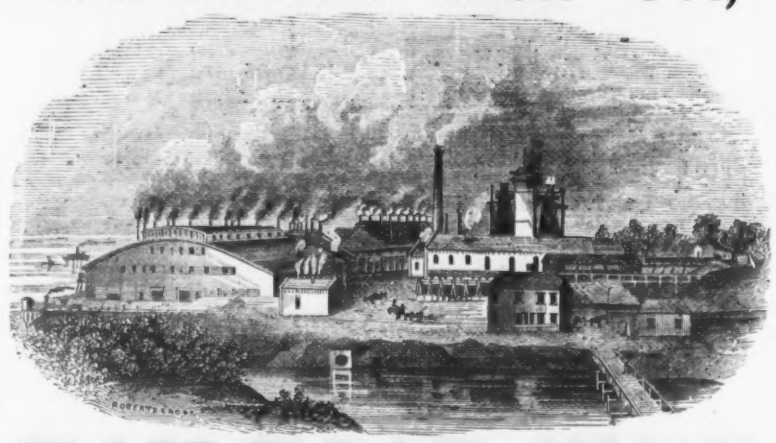
Also a Stock in Hand for Export.

STEAM PUMPS

Manufactured by CRANE BROS. MFG. CO., Chicago.

Iron.

MILWAUKEE IRON CO.,



RAILROAD IRON

From 30 to 65 Lbs. per Yard.

Re-Rolling done on short notice.

PIG IRON.

BEST No. 1 FOUNDRY IRON constantly on hand and for sale in car-load or larger lots, at lowest market price.

Merchant Bar Iron.

A FULL ASSORTMENT—SUPERIOR QUALITY.

Address all correspondence to

MILWAUKEE IRON CO.,
MILWAUKEE, WIS.

P. J. POTTER. JOHN W. HOFFMAN. WILLIAM TOOTHE. SOUTHARD HOFFMAN.

Potter, Hoffman & Co.,

110 Liberty St., N. Y.

GENERAL RAILROAD SUPPLIES.

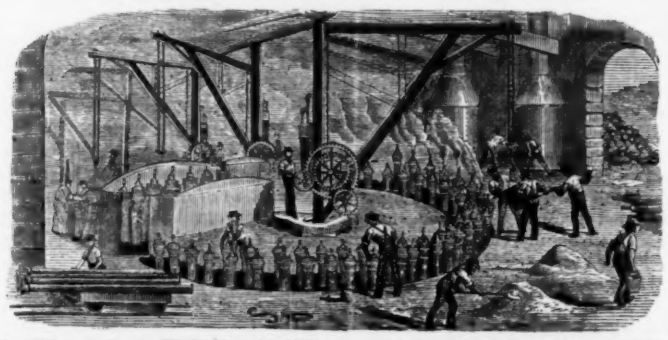
AGENTS FOR

Bay State Iron Co., Boston Mass. Homogeneous Plates, Rails, &c.
Crucible Steel Tires, Axles, Forgings, &c.
Chrome Tool Steel and Spring Steel.
Nichols, Pickering & Co.'s Springs.
Sax, Kear & Co.'s Patent Steel Tired Wheels.

JOHN McNEAL & SONS,

BURLINGTON, N. J.

Flange Pipes,



General Foundry Work.

CAST IRON PIPES

FOR WATER AND GAS.

John H. Reed & Co.,
IRON MERCHANTS.

And Agents for

BAY STATE IRON CO.

Manufacturers of and Dealers in

Homogeneous Boiler and Fire Box Plates.

GOLD MEDAL. BAY STATE IRON CO. HOMOGENEOUS FIRE BOX BOILER PLATE. BOSTON 1874.

Plate, Sheet, Pig and Railroad Iron.

Wrought Iron Girder, Channel & Deck Beams.

ANGLE & T IRON, BOILER & TANK RIVETS,

Lap-welded Iron Boiler Tubes,

Wrought Iron Steam & Gas Pipe.

OFFICES,

2 Pemberton Sqr., Boston, Mass.

Baltimore STEEL HOE Works.
O. H. HICKS & CO.

Manufacturers of the

Lockwood Hoe,

Send for Sample and Price List.

BALTIMORE, MD.

Iron.

WHEELS AND AXLES MADE OF THE BEST STOCK AND IN THE MOST careful MANNER. FURNISHED SEPARATELY OR "FITTED" MAKING COMPLETE SETS.

TAYLOR IRON WORKS

ON THE LINE OF THE CENTRAL R.R. OF NEW JERSEY

HIGH BRIDGE, N.J.

CAR WHEELS & AXLES

DRAW HOOKS AND FORGINGS.

LEWIS H. TAYLOR PRES'T. S. P. RABER SUP'T. JAS. H. WALKER SEC'T & TREAS.

NEW YORK OFFICE 93 LIBERTY ST.

STEEL TIRED WHEELS MADE UNDER SAX & KEAR'S PATENT FOR LOCO TRUCK AND TENDER PASS'R CAR SERVICE

ATKINS BROTHERS,

PROPRIETORS OF THE

Pottsville Rolling Mills & Pioneer Furnaces

POTTSVILLE, PENNSYLVANIA.

Having introduced New and Improved Machinery into their Rolling Mills, and manufacturing all their Iron from the ore, and also doing all Machine Work and Repairs in their own shops, they are enabled to produce

RAILROAD IRON

Of uniform quality, unsurpassed for strength and wear, and of any required length.
Address the Proprietors Pottsville, Pa.

The Britannia Ironworks Company, Limited,

Middlesbro' England,

MANUFACTURERS OF

ALL DESCRIPTIONS OF IRON RAILS

Surplus Stocks of Various Sections always on hand.

London Office: W. G. FOSSICK, 6 Laurence Pountney Hill, E. C.

Weekly Output, One Thousand Tons.

HEATON & DENCKLA,

HARDWARE COMMISSION MERCHANTS

PHILADELPHIA.

Branch Office, 97 Chambers and 81 Reade Streets, N. Y.

AGENCIES:

Mallory, Wheeler & Co.,	Foster's Horse Nails.	Union Mfg. Co.'s Drilled Butts.
American Screw Co.,	Anchor Brand Nails.	Western File Works.
Douglas Axe Mfg. Co.,	Lewis' Anvils and Chains.	Philadelphia Carriage Bolt
Stuart, Peterson & Co.'s Castings.	"Eagle" Trace Chains.	Aiken's Saw Sets.
Morton & Bremmer's Balances.	Roger's Ford Sad Irons.	Cast Steel, Octagon, Flat and Square, &c., &c.
	Hartford Mfg. Co.'s Locks.	
	Plymouth Mill Rivets.	

BAEDER, ADAMSON & CO.,

Manufacturers of

Sand and Emery Paper and Emery Cloth

(Also, in Rolls for machine work.)

GROUND EMERY, CORUNDUM AND FLINT,

Glue & Curled Hair, Cow Hide Whips.

STORES:

PHILADELPHIA, 730 Market St., BOSTON, 143 Milk St.,
NEW YORK 61 Beekman St., CINCINNATI, 92 Main St.,
CHICAGO, 182 Lake St.

BIRMINGHAM SCREW CO., Limited.

ALFRED FIELD, President.

The Screws of this company are imported only in small, limited quantities.

ALFRED FIELD & CO.,

Sole Importers,

93 Chambers and 75 Reade Streets, N. Y.

This cut shows the Snap pressed partly open.

Middletown Tool Co.

MIDDLETOWN, CONN.

Manufacturers of

The Celebrated "Baldwin" Plane Iron

HENSHAW'S SNAPS

Greatly Improved in Style and Pattern.

HART, BLIVEN & MEAD MFG. CO., Agents

18 & 20 Cliff Street, N. Y.

JOHN CRANE, Agent, 103 Chambers St., N. Y.

GREENSBORO' HANDLE WORKS

Manufacturers of SPOKES and CARRIAGE WOOD WORK, AXE PICK, German and American SLEDGE and other Handles.

Send for Catalogue and Price List.

JAMES C. HAND & CO

Commission Merchants,

PHILADELPHIA.

AGENTS FOR THE SALE OF

PIG IRON, Wm. Penn, Norristown and Reading Furnaces.
WM. JESSOP & SONS' Cast Steel, &c., &c.
READING NAIL AND IRON CO.'S (Crescent Brand) Nails, Brads and Spikes.
BARROW, SAVERY & CO.'S Tinned, Enameled and Plain Hollow Ware, Medium and Iron Hollow Ware, Sad, Tailors' and Laundry Irons, Fire Dogs, Wagon Boxes, Savery's Patent Coil Enameled Water Cooler and Refrigerator, &c., &c.
PENNSYLVANIA CORUNDUM CO.'S Corundum in Casks and Packages.
WASHINGTON MILLS EMERY CO.'S Best Turkish Emery in Casks and Packages.
FISHER & NORRIS' Patent American Anvils and Vises.

W. & B. DOUGLAS,

MIDDLETOWN, CONN.

The Oldest and Most Extensive Manufacturers of

PUMPS,

HYDRAULIC RAMS,

GARDEN ENGINES

AND OTHER

Hydraulic Machines

IN THE

WORLD.

Awarded the GRAND MEDAL of PROGRESS at WORLDS' EXPOSITION, VIENNA, 1873, being the highest awards on Pumps, &c., also, highest medal at PARIS in 1867.

Descriptive Catalogues and Price Lists sent when requested.

BRANCH WAREHOUSES,

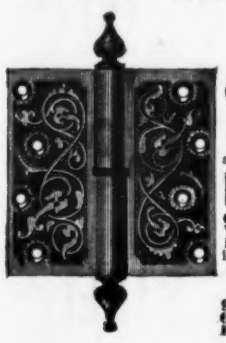
85 & 87 John Street, N. Y.

AND

197 Lake St., CHICAGO, Ill.

UNION MANUFACTURING COMPANY,

Manufacturers of all styles Plain and Ornamental Butts



LOOSE PIN REVERSIBLE,

Cast Fast & Loose,

Drilled and Wire Jointed.

Japanned, Figured Enameled, Nickel Plated, and Real Bronze Butts. Also, a full line of

IRON & BRASS PUMPS,

Cistern, Well, and Force Pumps, Yard, Drive Well, Garden Engine and Steam Boiler Pumps, Hydraulic Rams, etc., and all with the most modern improvements. ☞ Fine Castings a Specialty.

NEW BRITAIN, CONN.

Warehouses,

99 Chambers St., N. Y. 4 India St., Boston, (Butts.)
67 Kilby St., Boston, (Pumps.)
Heaton & Denckla, 507 Commerce St., Phila., (Butts.)
Send for New Illustrated Catalogue and Price List.

WRIGHT'S

Double Acting,

BUCKET - PLUNGER

STEAM PUMPS.

ALWAYS RELIABLE

VALLEY MACHINE CO., Easthampton, Mass.

THE TINNERS' FAVORITE.

Olmsted's Patent Late Improved Combined Setting Down Double Seaming and Deflecting Machine

This machine, so long and favorably known to the trade, has lately been materially improved, and is now presented as a perfect machine; working in X, XX, XXX and XXXX tin, sheet iron and copper, straight, flaring and oval work, such as wash boilers, coffee pots, &c. It is the only machine in use that double seams and sets down without changing the work. Its weight is 100 lbs. and its dies and setting down wheel are made of cast steel. The entire machine and attachments are constructed on a principle that secures its satisfactory operation. It is Warranted. No Tinner can afford to be without it. Price $35. See advertisement in *The Metal Worker*. Send for Circular and Price List to W. L. Headley, Manufacturer, 35 William St., N. Y. City. Also, Olmsted's Double Seaming and Deflecting Machine, and Waugh's Circular and Squaring Shears.

The Sugar Maker's Friend.

PRICE, $4.50 per hundred.

More agents wanted to canvass for the sale of Post's Patent Galvanized Metallic Eureka Sap Spout and Bucket Hanger. Samples, Circulars and Terms sent on receipt of 20cts to pay postage. Address,

C. C. Post, Manufacturer & Patentee Burlington, Vt.

ROBERT KING,

Sole Manufacturer of

Duckham's Patent Hydrostatic

Weighing Machines,

To weigh from 1 to 100 tons,

Hydraulic Presses and Testing Machines, Planishing Hammers and Sheet Copper Rolls.

246 to 250 Plymouth St., Brooklyn, N. Y

HEINZ, PIERCE & MUNSCHAUER,

BUFFALO, N. Y.

Manufacturers of

Palace Refrigerators

AND

ICE CHESTS.

Hard Wood Palace Refrigerators	3 sizes.
Oak Grained " "	5 "
Ice King " "	4 "
Oak Grained Double Door Ice Chests	5 "
Granite Painted " "	4 "

Filters and Coolers combined.

Send for Illustrated Catalogue.

Cucumber Wood Pump

No. 3

These goods are strictly first-class. They are made from selected Cucumber Timber, and carefully and substantially constructed, and when put into use are warranted to work satisfactorily in all respects.

WILLIAM A. RICH, Manufacturer,

Warehouse and Salesroom,

107 Reade Street, N. Y.

OSBORN M'F'G. CO.

79 TRADE MARK 79

BLEECKER ST. NEW YORK.

OSBORN'S METAL BRIGHT CAGES.

The Original Inventors and Manufactures of the

OSBORN BRIGHT METAL CAGES.

Also OSBORN & DRAYTON improvements under twelve different patents. We are continually bringing out new and beautiful designs to meet the demands of refinement and taste.

ALVAN DRAYTON General Agent.

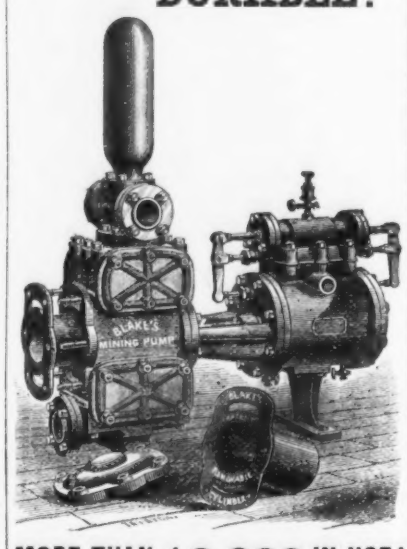
MORE THAN 10,000 IN USE!!

BLAKE'S

PATENT

Steam Pumps.

STRONG!
COMPACT!
SIMPLE! and
DURABLE!



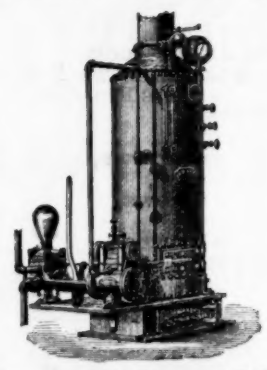
MORE THAN 10,000 IN USE!

Boiler Feed Pumps,
Tank or Light Service Pumps,
Mining Pumps,—Piston or Plunger Pattern,
Brewer's Mash and Beer Pumps,
Brewer's Water and Air Pumps,
Marine Circulating Pumps,
Marine Bilge and Fire Pumps,
Special Fire Pumps,
Tannery Pumps,
Marine Air Pumps,
Wrecking Pumps,
Oil Refinery Pumps,
Oil Line Pumps,
Blowing Engines,
Sugar House Pumps,
Vacuum Pumps—Fly Wheel Pattern,
Plunger Pumps—Double Acting,
Plantation Pumps,
Locomotive Pumps
Hydraulic Pumps,
Low Pressure Pumps,
Air Pumps,—Direct Acting,

Combined Boiler & Pump,

Acid Pumps,—Of Pure Composition,
Drainage and Irrigating Pumps,
Gas Works Pumps,
Lard or Soap Pumps,
Bleachery Pumps,
Vinegar Pumps,
Quarry Pumps.

MORE THAN 10,000 IN USE!



Cut above represents Pump and Boiler combined with fixtures complete for Railroad Water Stations, Hotels, Factories, &c.

Send for Illustrated Catalogue to

Geo. F. Blake Mfg. Co.,

79 & 81 Liberty St.,

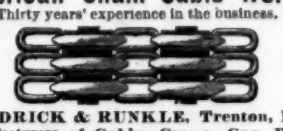
NEW YORK.

Cor. Causeway & Friend Sts., Boston.

50 & 52 S. Canal St., Chicago.

American Chain Cable Works.

Thirty years' experience in the business.



KENDRICK & RUNKLE, Trenton, N. J.

Manufacturers of Cable, Crane, Car Brake, Agricultural, Machine and Harness Chains of every description. Also, sole manufacturers of

KENDRICK'S PATENT IMPROVED TRIPLE COAL MINE SLOPE CHAIN.

N. B. The highest grades of Crane Chains a specialty.

Cheaper Stock for Pennsylvania Furnaces.

A Pennsylvania iron master, writing to the Reading *Eagle*, says:

At this period of depression in the iron trade throughout the world, when Pennsylvania manufacturers find profits in trade reduced to so narrow a margin that it is almost, if not quite, impossible to compete with other localities, it is important that the situation should be investigated, and the remedy be ascertained.

In counting up items of costs in the manufacturing of pig iron, we find that the labor employed at the different hematite iron ore mines that surround this city has been reduced to 80 cents per day. The cost of labor that is connected with the different blast furnaces in this vicinity has also been reduced from time to time in about the same proportion as that of mining ore. So far as the cost of labor is concerned that is employed at the iron ore mines or furnaces in this section, we find that there is no room for any further reductions. These prices are now about the same as before the war. The high prices paid for coal, ore and transportation are the items that are swelling up the cost of iron. They have remained up in price the same as during the rebellion, when iron brought from 100 to 300 per cent. more than it does now. Nearly all the furnaces in Eastern Pennsylvania, the great iron manufacturing district of this country, have been dependent on anthracite coal. These coal fields have within the last few years been controlled by several large corporations, composed principally of English capitalists, who have united on fixed prices for their coal, which are at variance with those of iron, labor, &c.

The principal railroads leading to the anthracite coal fields are also controlled by English capitalists, who have no sympathy with the iron industry of this country. Coal is carried from the Allegheny coal fields at one-third the rates that are charged by the leading lines in Eastern Pennsylvania. Some of the principal iron ore mines in Eastern Pennsylvania are also controlled by wealthy capitalists, who are at this period of extraordinary depression in the iron trade receiving a profit of at least 800 per cent. over the cost of mining the ore.

In making a comparison of actual values of coal and iron ores, nature saw fit to place here very sparingly, compared with localities in Virginia, West Virginia, &c., which are within easy reach of transportation to the iron industry of Eastern Pennsylvania. There are no foundations to warrant the views taken by those who have control of the anthracite coal fields. Some of the principal iron mines and railroads are apparently all combined to hem up an industry which has cost at least $100,000,000 to establish,

---

Since the accident in which the two companions of M. Tissandier lost their lives, thirty-seven proposals offering to solve the problem of maintaining life in the higher regions of the air, have been received by the French Society for the Promotion of Aerial Navigation, but of these only M. Trouve's has been considered likely to succeed. His system, which is minutely described by *Galignani's Messenger*, possesses the double merit of averting asphyxia and apoplexy: "The car of the new balloon is to be provided with a reservoir of compressed air sufficient to maintain the life of one man without discomfort for several hours. Its capacity will be a cubic meter, and the air will be compressed into it to the extent of five atmospheres. Now since a cubic meter of air weighs nearly thirteen kilogrammes, the contents of the reservoir will alone weigh about sixty-five kilogrammes; however, the whole apparatus with its contents and accessories is not to exceed 100 kilogrammes. As soon as the balloon attains a hight at which breathing becomes difficult, the æronaut will put on a sort of India rubber diver's dress, provided with an air-tight mask for the face. This mask has two tubes, which he inserts between his teeth; one of them has a valve opening inward for the supply of pure air from the reservoir; the other has a valve opening outward for the expulsion of the vitiated air. This constitutes the breathing apparatus. To avoid undue pressure, air from the reservoir is introduced into the diver's dress, which is composed of double India rubber stuff. The projector is so sure of success that he proposes to enter the iron chamber of the Sorbonne, where a vacuum can be produced, and there, provided with his apparatus he promises to bear a rarefaction equivalent to an altitude of 15,000 meters, (nearly nine and a half miles.")

In a very able paper "On Modern Blasting Agents," recently read by Mr. Nobel before the Society of Arts, the author thus explains the reasoning which led to firing slow explosives by local detonation: "When a hammer strikes a very thin layer of nitro-glycerine on an anvil the blow produces a strong compression of the liquid, which liberates heat and raises its temperature to the point at which it detonates. But only that part which actually receives the blow explodes. If, however, the hammer is very heavy, and the blow strong, the explosion is no longer confined to the part which receives the direct shock, and the whole goes off. A local detonation, owing to the immense tension of its gas, must be very similar in action to a strong blow, and will thus compress the explosive liquid which surrounds it causing it to detonate at will and to propagate the explosion throughout the whole mass by the same means. Whether that theory be correct or not, it led to a result which affords considerable facilities for the utilization of modern explosives. It enables us, with or without confinement, to turn a solid or liquid substance of very harmless appearance instantaneously into gas, which occupies the same or nearly the same bulk, but has an expanding tendency which for nitro-glycerine gas must come near a pressure of 500 tons per square inch."

The Jackson Iron Company.

The Cleveland *Review* says:

The Jackson was the pioneer iron company in the Lake Superior district, having opened their mine at Negaunee in 1846, twenty-nine years ago. But little was done, however, for several years in the shipment of ore. Docks had to be built at Marquette, and a plank road from Marquette to the mine, a distance of 12 miles. Meanwhile the St. Mary's canal was completed, and in the season of 1856 regular shipments were commenced by sending to market 5000 tons of ore.

Since that time its success has been uninterrupted, and it is owing largely to the preserving effort and enterprise of this company that others followed, and the Marquette country has reached its present stage of magnificent development.

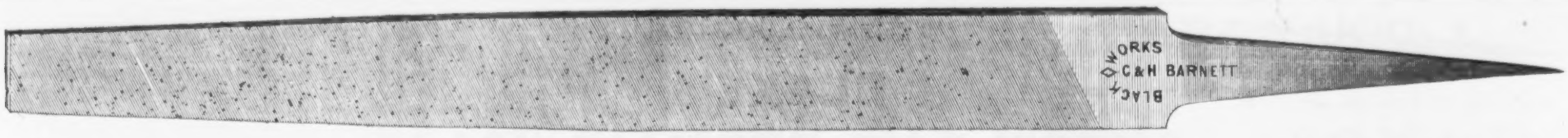
The company's property is very valuable, covering a large plant of hematite of the specular, granular and slate varieties, and large quantities of the soft red and brown oxides. These ores have always been regarded with particular favor for their remarkable purity and large per cent. of metallic iron. The mine is one of the most interesting in that country, if not in the world, and is worked in a most complete manner, and is capable of yielding from 50,000 to 100,000 tons of ore per annum, without trouble. The largest amount taken out in one season was 131,000 tons, in 1868. It is proposed the present season to mine but 50,000 tons. The total product of the mine, up to the end of last season, was 1,416,717 gross tons.

The company also operate two furnaces, located at Bay de Noc, Lake Superior, one of which went into blast in 1867, and the other in 1870. These furnaces produced, up to the end of last year, 57,260 gross tons of pig iron, and rank next in the amount in their product to the most productive one of the entire group in the district.

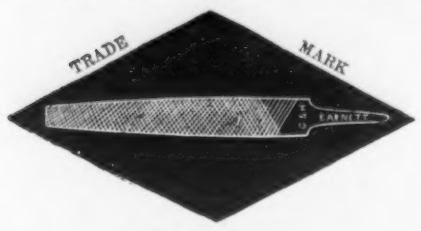
New Electric Clock.—Mr. R. S. Symington, telegraph engineer to the Scottish Telegraph Construction Company, Glasgow, has just applied to the Clydesdale bank an electro-magnetic clock, understood to be the invention of Prof. Wheatstone, but the principle of which was first announced by Prof. Faraday. This ingenious and interesting piece of mechanism, although not indicating "the time of day" by any index of its own, is so arranged as to control the movements of any number of connected clocks by means of magnetic currents. Faraday's principle was that of introducing a magnet into the aperture of a hollow coil, and thus creating a current which may be repeated as often as the magnet is removed to and from the coil. In the machinery at the Clydesdale bank a ponderous weight supplies the original motive power. This weight acts upon a pendulum working between two piles of magnets by cog wheels, a current of electricity being drawn from each set in turn. By the agency of spiral wires this current is conducted to sixteen clocks, placed in different parts of the premises. These clocks vary in size and appearance from the two leading 24 inch dials in the vestibule to the ormulu timepiece in the bank parlor. In a miniature coil connected with the central magnetic pile is a needle, which is forced to revolve by alternate currents just as the needle of a compass would do were the same influence brought to bear upon it. This needle guides and controls miniature wheels, the pivot rods of which are extended to the front of the dial where the hands are joined on in the ordinary way. Of course, it is absolutely necessary to maintain the accuracy of the central machine, and this is obtained by establishing electrical communication between the pendulum at the bank and the Observatory clock at Dowanhill. Should the machinery in the bank move too fast it may be regulated every two hours by an electric current freeing a lever which has the effect of stopping the machinery during the space of time it may be in advance. Accurate timekeeping is thus maintained in the central and dependent machinery.

The Copper Cent.—As the old "red cent" has now passed out of use, and, except rarely, out of sight, like the "old oaken bucket," its history is a matter of sufficient interest for preservation. The cent was first proposed by Robert Morris, the great financier of the Revolution, and was named by Jefferson two years after. It began to make its appearance from the mint in 1792. It bore the head of Washington on one side, and thirteen links on the other. The French Revolution soon created a rage for French ideas in America, which put on the cent, instead of the head of Washington, the head of the Goddess of Liberty—a French liberty, with neck thrust forward and flowing locks. The chain on the reverse side was displaced by the olive wreath of peace, but the French liberty was short lived, and so was her portrait on our cent. The next head or figure that succeeded this—the staid, classic dame with a fillet around her hair—came into fashion about 30 or 40 years ago, and her finely chiselled Grecian features have been but slightly altered by the lapse of time.

Rapid Process for the Detection of Lead in the Tin Lining of Vessels.—M. Fordos gives the following description of a method of detecting lead in tin: Place, with a tube plunged in pure nitric acid, a slight layer of acid upon any part of the tinning, selecting by preference the thickest parts. Both metals are attacked, forming stannic oxide and nitrate of lead. After a few minutes heat slightly to expel the last traces of acid, and allow to cool; then touch the pulverulent spot produced by the acid with a tube dipped in a solution of 5 parts of iodide of potassium in 100 of water. The iodide has no action upon the oxide of tin, but with the nitrate of lead it reacts, forming a yellow iodide of lead, and showing the presence of even a small quantity of this metal. The surface of the tinning must be carefully cleansed before applying the nitric acid, and the acid should not penetrate to the iron or copper which forms the body of the vessel, as the reaction would then be complicated.



SEND FOR ILLUSTRATED



PRICE LIST.

BLACK DIAMOND FILE WORKS.

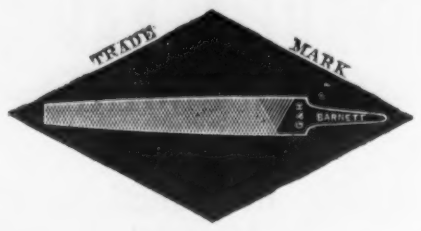
G. & H. BARNETT,

39, 41 & 43 Richmond Street, PHILADELPHIA.

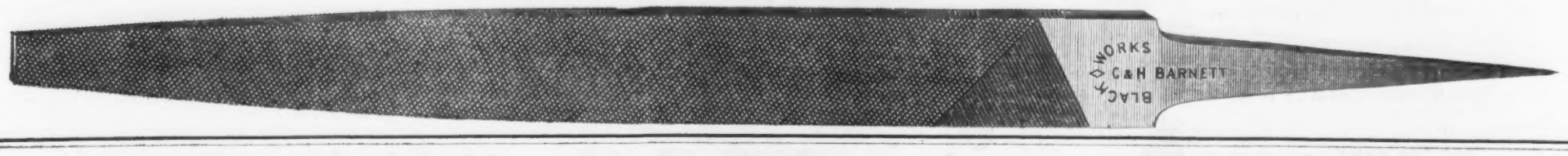
SOLE AGENTS:

LINFORTH, KELLOGG & CO., 3 & 5 Front St., San Francisco, for the Pacific Coast.
SEMPLE, BIRGE & CO., 13 South Main St., St. Louis, Mo.

SEND FOR ILLUSTRATED



PRICE LIST.



USE THE BEST.

Pawtucket, R. I.

The American File Company have the exclusive right to use the Bernot process for cutting files By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing files and steel.

Goods of all known manufacturers have been repeatedly tested, and interesting tables have been compiled showing the working qualities of files made by different makers, and of files made from different steels, and with various shapes and angles of tooth They have thus reduced the manufacture of files to an exactness and perfection with a uniformity of result, as they believe, never before attained. No file, foreign or domestic, that they have ever tested, has equalled the performances of their own goods taken at random from their stock. Their machines are capable of the most delicate adjustment, and can produce the very finest work known to the trade. Special files made to order. Prominent file manufacturers are having their best goods from our works.

Price lists and information furnished on application.

AMERICAN FILE CO., Pawtucket, R. I.

THE BEST IS THE CHEAPEST.

McCaffrey's Standard American Hand Cut Files and Rasps are warranted to do more work than any other files and rasps in the market.

SILVER MEDAL. TRADE MARK. HIGHEST PREMIUM.

PENNSYLVANIA FILE WORKS.

McCAFFREY & BRO.,

No. 1732, 1734 & 1736 North Fourth St., Phila.

Messrs. ARNOLD & CO., 310 California St., San Francisco, Sole Agents for the Pacific Coast.

L. B. HELLER. I. R. DENMAN.

L. B. HELLER & CO.,

Manufacturers of Celebrated

American Horse Rasps and Files.

OFFICE, 190 Market Street,

P. O. Box, 223. NEWARK, N. J.

ELIAS G. HELLER. GEO. E. HELLER.
PETER J. HELLER. JOHN J. HELLER.

For the information of persons unacquainted with our goods, we will state that every

FILE OR RASP

manufactured by us since our establishment in 1856, has been stamped "Heller & Bros.," though commonly called the "Heller Rasp."

All Rasps not stamped as annexed diagram are not the original, genuine article. The trade will please notice the addition to our trade mark, which was formerly a horse, and is now changed to the trade mark represented by the cut.

Established 1816.

Peter A. Frasse & Co.,

95 Fulton Street, New York,

SOLE AGENTS FOR

Thomas Turner & Co.'s Suffolk Works,

SHEFFIELD.

FILES AND HORSE RASPS,

And Importers of

P. S. STUBS' FILES, TOOLS & STEEL,

W. J. Davies' Sons' London Emery Cloth,

HUBERT'S FRENCH EMERY PAPER.

EVERY FILE WARRANTED.

Equal to the

BEST.

Western Files. Western Files.

Works, Beaver Falls, Pa. Office, 96 Chambers St., N.Y

Western Files. Western Files.

LARGEST CAPACITY

Of any File Works in the World.

In the face of strong prejudice against American files, this brand has earned a reputation second to none. The trade in all sections testify to their excellence. We confidently offer these files as superior in every respect and cheaper than any first-class file in the market. A trial will confirm their reputation.

MINOT & CO., 239 Franklin St., Boston, New England Agents.

Machinery without Lubricant

METALINE.

Machinery Metalined, or Metaline furnished to Machine Builders.

No oil or attention required. Runs with little or no wear No dirt or danger from fire. No damage to goods in process of manufacture. Years in use by best concerns, who are refitting old, and ordering new machinery to be metalined.

AMERICAN METALINE COMPANY,

61 Warren Street, New York City.

W. C. DUYCKINCK,

Importer and Manufacturer of

Steam Water Gauges,
Pipe and Fittings,
Scotch Glass Tubes,
Tube Expanders,
Twist Drills,
Emery Wheels,
Pipe Fitters' Tools,
Moulders' Tools,
Blacksmiths' Tools,
Machinists Fine Tools
Forges,
Hammers,
Wheelbarrows,
Wrenches,
Jack Screws,
Vises,
Flue Brushes,
Waste,
Belting,
Hose,
Packing,
Stubs' Goods,
Hair Felt,
Polishing Felt,
Emery Cloth,
Hand Drills,
Iron Punches,
Iron Shears,
Files,
Governors,
Bolts,

Railroad & Machinists' Supplies.

SEND FOR PRICE LIST.

50 and 52 JOHN STREET, NEW YORK.

AUBURN FILE WORKS,

Superior Hand-Cut

FILES AND RASPS,

MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.

FULLER BROS., Sole Agents,

89 Chambers and 71 Reade Streets, N. Y.

JOHN I. BROWER & SON,

Hardware Merchants,

288 Greenwich Street, NEW YORK.

HORSE SHOES.	HORSE NAILS.	HORSE RASPS,
Burden's,	Putnam's,	Thos. Turner & Co.'s, Sheffield Eng.
Parkins',	Globe.	TOE CALKS,
Shiew's	Vulcan.	Winsted.
Rhode Island,	Ausable,	HAY RAKES,
Goodenough,	Ausable Pointed & Polished,	Brenkenridge's.
Shoeuberger.	Ausable Pointed & Blued.	

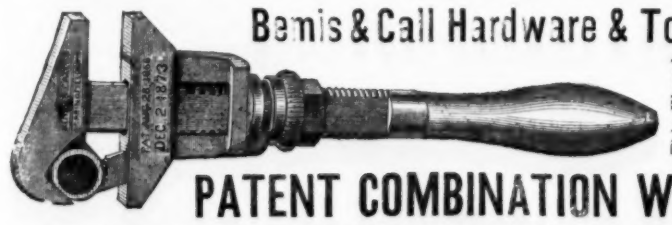
JOHN ROTHERY'S

Celebrated Hand-Cut FILES,

Made of Best English Cast Steel.

WALSH, COULTER & FLAGLER, Sole Agents,

83 Chambers and 65 Reade Streets, N. Y.



Bemis & Call Hardware & Tool Co.'s

This Wrench can be furnished with Briggs' Pat. Nut or Sleeve.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Hardened throughout, and not only combine all of the superior qualities of our cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench, thus making a Combination which has no equal.

For Circulars and Price List, address,

BEMIS & CALL HARDWARE & TOOL CO., Springfield, Mass.

BACKUS BROTHERS,

Manufacturers of

The Backus Water Motor,

Cor. Wright St. and Ave. A,

Bet. Chestnut St. & S. Broad St. Depots, Newark, N. J.

What They will do.

These Motors are adapted to running light machinery, such as Coffee Mills, Printing Presses, Lathes, Drug Mills, Church Organs, Sausage Cutters, Ice Cream Freezers, Elevators, Hoisting Machines and everything requiring similar power, in cities of towns where there are Water Works.

And the best "Motor" in the world for family sewing machines. Send for Circular.

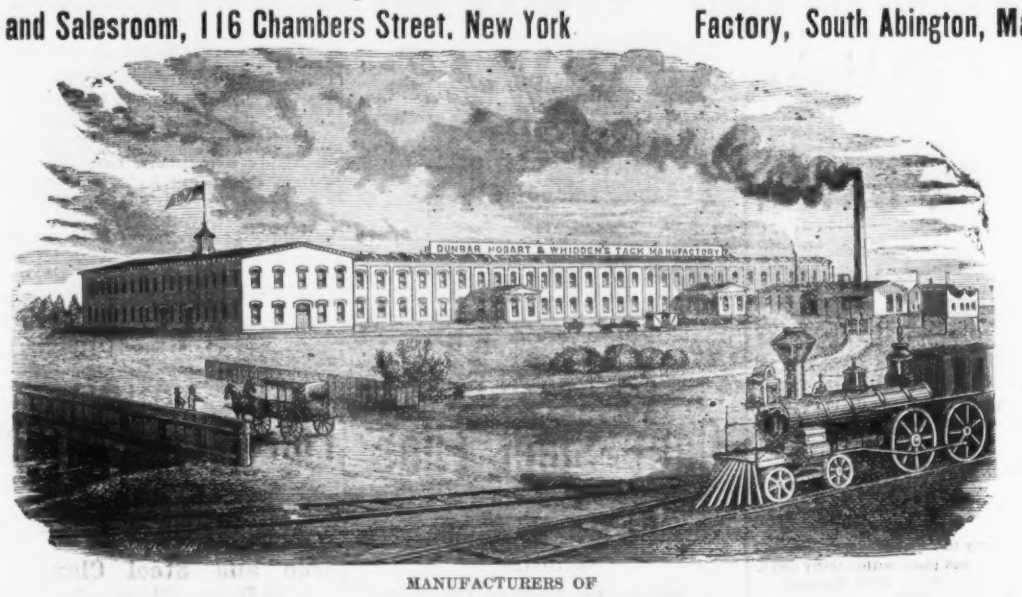
HOBART'S TACKS.

MANUFACTURED BY

DUNBAR, HOBART & WHIDDEN,

[Established 1810.

Office and Salesroom, 116 Chambers Street, New York. Factory, South Abington, Mass.



MANUFACTURERS OF

American, Swedes and Copper Tacks,

Tinned, Leathered and Large Head Carpet Tacks, Finishing Nails, Black and Tinned Trunk Nails, Miners', Gimp, Lace and Brush Tacks, Hungarian, Chair, Cigar Box and Barrel Nails, Glaziers' Points,

IRON, STEEL, COPPER, ZINC AND BRASS SHOE NAILS,

Heel and Toe Plates, Steel Shanks, and Fancy Head Nails, Silver or Japanned Lining and Saddle Nails.

A full assortment always on hand at salesrooms, for immediate delivery if required. Odd and irregular sizes made to order or cut from sample at short notice. Send for Price List.

Hopkins & Dickinson Manufacturing Co.,

FINE METAL WORKERS,

Works, Darlington, N. J. 69 Duane Street, N. Y.

Hand Made Locks and Real Bronze Hardware.

NEW AND ARTISTIC DESIGNS FOR

Private Residences, Banks, Churches and Public Buildings.

OTIS PASSENGER —AND— FREIGHT ELEVATORS

For HOTELS, OFFICE BUILDINGS, STORES, WAREHOUSES, FACTORIES, MINES, BLAST FURNACES, &c.

OTIS BROTHERS & CO.
SOLE MANUFACTURERS,
348 Broadway, New York.

Eureka Self-adjusting

SCALES.

Have a patented *attachment for* ascertaining the *tare* of a *dish* or other *receptacle* used in weighing *without* the use of *weights* or *loss* of *time*. Manufactured only by

JOHN CHATILLON & SONS,
91 & 93 Cliff St., N. Y.

THE
CANADIAN BANK OF COMMERCE.

Capital - - $6,000,000, Gold.
Surplus - $1,800,000, Gold.

The New York Agency, 50 Wall St.,

Buys and sells Sterling Exchange, makes Cable Transfers, grants Commercial Credits, and transacts other Banking Business.

J. G. HARPER, J. H. GOADBY, } Agents.

CROCKER BROTHERS,

32 Cliff Street, N. Y.

METALS.

Anthracite Pig Irons,

COLD AND WARM BLAST CHARCOAL IRONS,

American and English Bessemer Irons, Iron Ores.

COPPER, TIN, &c.

Advances made on Merchandise.

REED & BARTON,

Manufacturers of FINE

Electro-Plated Table Ware

OF EVERY DESCRIPTION,

Would call especial attention to their new

Patent China-Lined

ICE PITCHERS.

These Pitchers are made of the finest quality of white metal, heavily plated with silver. They are finely engraved and chased in a great variety of decorations. The linings are of fine stone china. The top is secured to the body of the Pitcher in such a manner that it can be easily detached and the lining removed for cleaning or other purposes.

Many improvements attained are noticeable in these Pitchers. Water and ice standing in them do not come in contact with any metal whatever. They are perfectly clean, and easily kept so. They are perfectly free from all odor or rust. Lemonade, beer, milk, etc., may be kept cool in and drank from these pitchers without endangering health. There can be nothing cleaner or purer for holding liquids than pure, white china. There is no possibility of leakage.

The construction of the Pitcher is such that the lining can be easily replaced at a very small cost.

Factories, Taunton, Mass.

Salesroom, No. 2 Maiden Lane, New York.

BUSINESS ITEMS.

PENNSYLVANIA.

The Valentine Iron Company, of Bellefonte, are at the present time enlarging their works, building a new furnace, and putting in several new boilers, and repairing them in general. They have more orders on hand now than they can possible fill for some time to come. It was impossible to get along without enlarging, as the demand upon the works had become so great.

Although it is only a little over two months since the axe and hoe factory at Beaver Falls, Pittsburgh, were burned, new building have been erected and the works put in operation again.

W. D. Wood & Co. have doubled their capacity for the production of Russia and patent planished sheet iron, at their mills in McKeesport.

The Hazard Manufacturing Company have lately built a wheel-house, and are now constructing a water-wheel which will be 40 feet in diameter, and 6 feet 3 in. in width, of which Mr. H. Deppe, of Millport, is the builder. The wheel will be provided with an iron shaft and iron spiders.

The rolling mill of the Blandon Iron Company, at Blandon, has resumed work, having been idle since February last, owning to a strike of the puddlers. The puddlers now employed are new men, and the strikers endeavored to drive them off by force, but were dispersed by the authorities.

The Keystone Bridge Company has just completed the draw of the bridge over the Raritan, on the New York and Long Branch Road. It is 472 feet long and has two clear openings of 200 feet each. The draw is worked by two steam engines of 8x12 inch cylinders, and it takes about three minutes to swing it.

Thin sheets of iron (1-10,000th of an inch in thickness) are being rolled at Graff, Bennett & Co.'s, Pittsburgh, from iron puddled in their Danks machines.

The Pittsburgh Locomotive Works recently delivered two heavy 32-ton freight engines to the Indianapolis, Peru & Chicago road.

The La Belle Steel Works, Allegheny, to keep up with orders are now erecting two hammers—one of 1400 lbs. for steel tilting, the other for forging axles.

The machine shop of James Brown & Son, in Pittsburgh, was burned the 19th ult. The shops were six story brick buildings. Loss on stock and buildings, $65,000; insurance unknown.

A new coal machine, the invention of Dr. J. R. Hayes, "for pressing coal dust into fuel," has been put in operation at Harrisburg. "A ton of coal was made by it in six minutes." This is stated to be the first successful effort made in this country for the utilization of coal dust on a large scale; and the machine, which is described as "simple, cheap and universally practicable," will, it is hoped, "add millions of dollars to the coal wealth of Pennsylvania."

N. & A. Middleton, Philadelphia, are running their works night and day, having large orders for their Bessemer steel springs, beside orders for 68,000 wool-packing springs.

NEW JERSEY.

The Passaic Rolling Mills, at Paterson, are running double turn and employing 400 men. Beside bridge and shape iron for the Watson Manufacturing Company, the mills have been turning out some very large and heavy beams for the new Capitol building, at Albany, N. Y.

MASSACHUSETTS.

The Washburn & Moen Manufacturing Company have begun the erection of a new building at their works at Quinsigamond Village, near Worcester, 1000 feet long and 50 feet wide, of wood, in which they propose to begin the manufacture of charcoal steel wire and rods, a new industry for Worcester. They will put in four fires at the start, and add more after the establishment is in working order. A steam hammer, with a 2½ tons stroke is to be included in the machinery of the new works.

The Taunton Locomotive Works have contracted to build 12 large locomotives for the Union Pacific Railroad.

The Union Car Spring Company, who were burned out at Springfield, have resumed business in a modest way in the blacksmith shop of the Boston & Albany Railroad over the river.

Frank Chapman is rapidly completing the full equipment for his new cutlery works at Holyoke, and will get them in full running order in about two weeks, when he will employ some 50 men.

RHODE ISLAND.

Mr. John B. Anthony, president of the Providence Tool Company, has returned from his visit to Turkey, and with contracts for the Martini-Henry rifle sufficient to keep the works running for two years longer. He was received with great honors at the court of the Sultan, and decorated with the order of Osmanli.

CONNECTICUT.

The Seth Thomas Clock Company, of Thomaston, have the contract for the large town clock the gift of Mr. Henry Seybert, of Philadelphia, to that city for Independence Hall, to be completed by July 4th, 1876. The bell will weigh 13,000 pounds, for each of the thirteen original States. The total value of Mr. Seybert's gift is $20,000.

The Howe Sewing Machine Company, at Bridgeport, have begun the manufacture of the Manning Machine for use in making boots and shoes and other heavy work. The company recently purchased the right for $20,000, and expect to make this branch of their business an important one.

The Shear works in Naugatuck were burned the 18th inst. Loss $10,000; insurance, $5000.

A building 30x80 feet is being erected by the Coe Brass Company, at Walcottville, in which will be placed the machines used for stamping, cutting out cartridges, etc.

The Sharpe's Rifle Company, at Hartford, has definitely decided to move to Bridgeport.

INDIANA.

The Indianapolis Rolling Mill has contracted to make for the Jeffersonville, Madison and Indianapolis Road new iron rails sufficient to relay seventeen miles of track, the rails to be furnished as fast as the company needs them, between this and November 1.

The Ohio Falls Car Works, at Jeffersonville, have turned out two reclining chair parlor cars for the Indianapolis, Bloomington & Western Railroad.

MICHIGAN.

The Marquette City steam forge is running at present on an order for car axles from the Chicago & Northwestern Railroad Co. The proprietors are expecting orders that will keep them busy all summer.

MARYLAND.

Twenty thousand pounds of Ore Knob copper were recently sold to Henry McShane & Co., brass and bell founders, Baltimore. This was the first product of ingots of the Ore Knob Copper Company, located in the Allegheny Mountains of North Carolina.

NEW HAMPSHIRE.

The Exeter Foundry and Machine Company at a meeting of the stockholders, May 24, voted to increase its capital stock from $26,000 to $55,000, and to change its name to the Exeter Machine Works.

The main building of the Agricultural Works, in Lebanon, was burned the 11th ult., together with the valuable machinery and stock. The loss is $33,000, partially insured. One hundred and fifty workmen are thrown out of employment by the disaster, and they have lost all their tools.

Blood's Locomotive Works, at Manchester, will be run for the present only five days in a week. About 150 workmen are employed there now, which is less than one-fourth required to run the works at the full capacity.

The Goodell Company have shut down their cutlery works in Bennington, and commenced moving the stock and machinery to Antrim.

OHIO.

The galvanizing iron works of the Cleveland Boiler Plate Company are driven to their full capacity, with orders ahead. The boiler plate department has also of late been kept more than ordinarily busy. It is the intention of the company to commence the manufacture of steel plate within two weeks.

The Cleveland Scale Company have added to their premises a three story brick building 17x75 feet, to meet an increased demand for scale, safe, letter press and similar work.

The Canton Wrought Iron Bridge Company have now under contract over $160,000 worth of wrought iron bridge work. The work done in this establishment last year ran over $400,000. They are now building a railroad bridge in Iowa, also one at Saginaw, with 200 feet swing and 160 feet truss.

The Youngstown *Tribune* says, that Robert McCurdy, Esq., has sold his one-eighth interest in the Enterprise mill, at that place, to Messrs. James Cartwright, Chas. Cartwright, Samuel J. Aikins, and William H. McCurdy. Consideration, $50,000.

The Bellaire Nail Works have successfully introduced a self nail feeder. The striking feeders have concluded to go back to work.

Bolton, Meyers & Co., of Canton, are improving their steel works by enlargement and the construction of a Siemens-Martin furnace. A superior quality of crucible, tool and spring steel is made by this firm.

The Iron and Steel Company, of Ironton, have plenty of orders, and every department of the mill is running.

The Etna Iron Works, at Ironton, O., were organized in January, 1873, with a capital stock of $1,000,000, of which $250,000 embraced two charcoal furnaces and 20,000 acres of developed ore land. Notwithstanding the panic, and the fact that a large majority of the stockholders were in favor of suppression of operations, work was pushed steadily on, until the enterprise is now near completion. The work consists of a plant of self-coking furnaces, 87 feet 6 inches high, 27 feet 6 inches diameter of casing, and 18 feet 6 inches in diameter of boshes. Each furnace has four Whitwell hot blast stoves with a heating surface of over 50,000 square feet, the temperature of the blast to be sustained from 1400° to 1600°. The chimney is 195 feet high and 9 feet in the clear, this hight being necessary to create a draft for the thorough combustion or oxidization of gas in the stoves. There will be 12 cylindrical boilers in three batteries, each boiler 64 feet long. In the engine house, which is covered by iron water tanks, there will be five vertical engines. The steam hoist tower, which is built of iron columns, will be operated by two engines, each being separate and independent of the other. The stock house will contain bins having a capacity of 10,000 tons. In the stock house there will be constructed four calcining bins, each 40 feet high, with 35 feet boshes. As the ore comes from the company's mines, by its own narrow gauge road, the 6-ton cars will be hoisted and lowered by friction pulleys, and the ore dropped into the kilns. It is estimated that one ton of coal slack will calcine 30 tons of ore.

The Minong (Mich.) Copper Mining Company is about to inaugurate operations on an extensive scale at Isle Royale. There are some sixty ancient pits on the company's property, and it is estimated that with the tools then in use it must have taken a hundred thousand men a hundred years to perform the work done by that ancient and unknown race. Certain it is that copper exists there in almost inexhaustible quantities, and no mine has yet been developed on one of these ancient sites which has not proved profitable.

GEORGE GUEUTAL & SON,

39 West 4th St., New York.

IMPORTER OF

Wood Screws, Steel in Sheets,

BAND SAWS, TOOLS FOR BRAZING, &c.

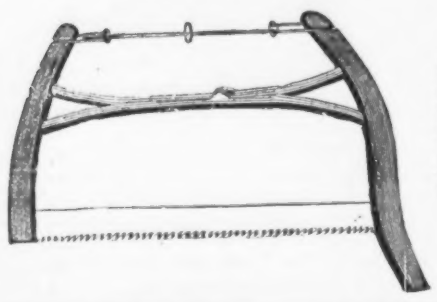
Bed Screws, Pin Hinges, and Wire Nails a Specialty.

H. W. PEACE,

MANUFACTURER OF

Saws of all kinds.

FACTORY, WILLIAMSBURGH, N. Y.



Elliptic Forked Saw Frame.

Patented June 28th, 1870.

The annexed engraving represents my ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the Frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE,
Sole Proprietor & Manufacturer,
VULCAN SAW WORKS,
WILLIAMSBURGH, N. Y.

AMERICAN SAW CO.,

Manufacturers of

Movable Toothed Circular Saws,

PERFORATED CROSS-CUT SAWS

And SOLID SAWS of all kinds. Trenton, N. J.

THE SILVER STEEL

DIAMOND CROSS-CUT SAW.

$1.50 Per Foot.

Patent Secured

PATENT HANDLES AND GAUGE INCLUDED.

THIS new Saw, which is destined to take the place of all Cross-cut Saws in point of **SPEED AND EASE**, is manufactured by **E. C. ATKINS & CO., Indianapolis, Ind.**, who are the

SOLE MANUFACTURERS FOR THE UNITED STATES.

So confident are we that this is the best Cross-cut Saw in the market that we CHALLENGE THE WORLD. Orders promptly filled.

E. C. ATKINS. H. KNIPPENBERG.

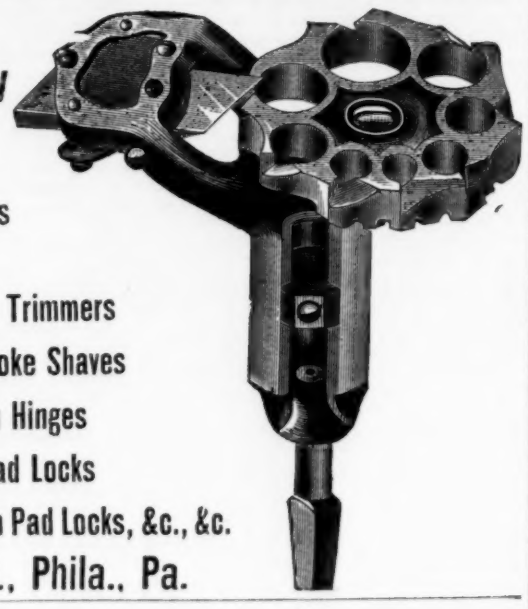
E. C. ATKINS & CO.
Saw Manufacturers and Repairers, Indianapolis, Ind.

Lloyd, Supplee & Walton,

HARDWARE FACTORS.

MANUFACTURERS OF

Bonney's Hollow AUGERS.



Stearn's Hollow Augers and Saw Vises

Bonney's Spoke Trimmers

Double Edge Spoke Shaves

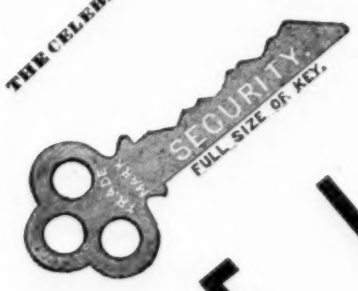
Adjustable Gate Hinges

Scandinavian Pad Locks

Flat Key Brass and Iron Pad Locks, &c., &c.

625 Market St., Phila., Pa.

THE CELEBRATED



YALE LOCKS

FOR ALL USES.

ORNAMENTAL

Real Bronze Hardware,

YALE LOCK MFG. CO.,

Stamford, Conn.

Salesroom, No. 298 Broadway, NEW YORK.

E. M. Boynton,

80 Beekman Street,

NEW YORK,

Manufacturer of

Saws of all kinds.

Also Sole Manufacturer of

LIGHTNING SAWS.

Two Direct Cutting Edges, instead of one Scraping point.

Note extra steel and durability over the old **V**, outlined on **M** tooth.

Telegram Dated Oct. 1st, 1874.

STATE FAIR, EASTON, PA.

To HENRY DISSTON & SONS:

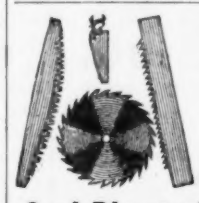
Philadelphia, Pa.

I want you to publicly test that challenge on Cross Cut Saws. Name time and place within thirty days. American Institute preferred. E. M. BOYNTON.

E. M. Boynton gave on Wednesday of last week an exhibition of what his Lightning Saw could do at the Pennsylvania State Fair, in which two men sawed through a sound oak log, 16 inches in diameter, in 17 seconds. Mr. Boynton informs us that his export trade is increasing, he having lately made large shipments of his saws to Australia and other distant markets.—*The Iron Age*, Oct. 8, 1874.

For fuller report of this exhibition see the *Easton Morning Dispatch* of Oct. 1st, 1874.

Henry Disston & Sons cannot furnish Lightning Saws. Why do they imitate mine?



J. FLINT,

Manufacturer of

ALL KINDS OF

SAWS

And Plastering Trowels,

ROCHESTER, N. Y.

A large Stock of **Cross Cut Saws** constantly on hand. Orders filled promptly. **Dietrich's Double Handle One Man Cross Cut Saw** made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superior to any in the market. Send for Illustrated Price List.

Putnam's Government Standard FORGED

HORSE SHOE NAILS.

Manufactured from the best of **NORWAY** Iron, and warranted to give entire satisfaction.

S. S. PUTNAM & CO.,
NEPONSET, MASS.

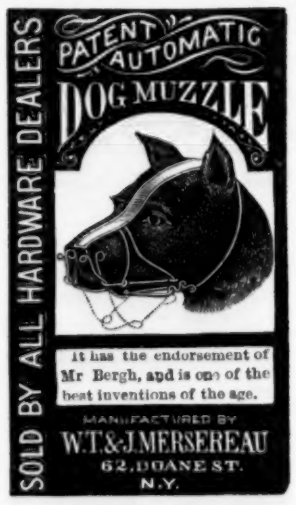
Rogers' Self-Sharpening

HOE.

The best Hoe in market. It will not batter or break. Wears itself sharp. Will last twice as long as any other Hoe, and is warranted to cut the "Bolles Hoe" or any Hoe in market.

For Sale at Manufacturers' Prices by

RUSSELL & ERWIN MFG. CO., - - New York.
BYRNE & FITZSIMONS, - - - - Albany, N. Y.
KENNEDY, SPAULDING & CO., - - Syracuse, N. Y.


PATENT AUTOMATIC
DOG MUZZLE
SOLD BY ALL HARDWARE DEALERS
it has the endorsement of Mr Bergh, and is one of the best inventions of the age.
MANUFACTURED BY
W.T.&J.MERSEREAU
62, DOANE ST.
N.Y.

Clement & Hawkes Mfg. Co.,

Manufacturers of

SHOVELS,

Planters' Hoes, Trowels and Machinery.

Northampton, Mass.

☞ Send for Circular and Price List.

WHEELER, MADDEN & CLEMSON,

Manufacturers of Warranted Cast Steel

SAWS

of every description, including

Circular, Shingle, Cross Cut, Mill, Hand, Roberts' and other Wood Saws,

&c., &c

Cast Steel Files

of the well known brand of

Wheeler, Madden & Clemson.

FACTORIES:

Middletown, Orange Co., N. Y.

BRANCH OFFICE:

97 Chambers Street, New York.

BRUNDAGE FORGED HORSE NAILS,

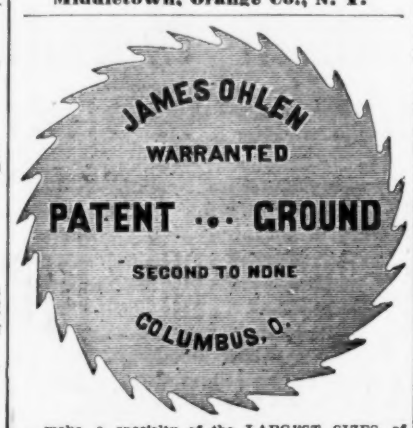
Manufactured from

BEST NORWAY IRON,

by BRUNDAGE & CO. Sold by

WHEELER, MADDEN & CLEMSON

Middletown, Orange Co., N. Y.



make a specialty of the LARGEST SIZES of **Circular Saws**, and call particular attention of lumber manufacturers to the following points of excellence:

Evenness of Temper.—The peculiar structure of my furnace subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

Perfect Accuracy in Thickness.—My saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

Properly Hammered.—Great care is taken that no saw shall leave my works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, cannot be successfully run—hence the importance of so hammering the saw as to effect equal strain in all its parts, and at the same time RUN TRUE. This department is under the personal supervision of myself, who has devoted over *twenty years* to the art of saw making.

I am sole proprietor and manufacturer of the celebrated **"Challenge" Cross-Cut Saw.** Price Lists of all kinds of saws sent on application.

JAMES OHLEN.

V. G. HUNDLEY, Agent,
79 Reade St., N. Y.

NORTH CAROLINA HANDLE CO.,
(Wilson & Shober, Props.)
Manufacturers of
AXE, PICK, GERMAN & AMERICAN SLEDGE, and other Handles.
Full assortment always on hand.

VAN WART, SON & CO.

Hardware Commission Merchants,

BIRMINGHAM, - ENGLAND,

Agents,

VAN WART & McCOY,
134 & 136 Duane Street, N. Y.

George H. Gray & Danforth,
48 India Street, Boston.

F. W. TILTON,
17 Old Levee Street, New Orleans.

At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for

John Rimmer & Son's Celebrated Harness and other Needles.

Agents for

Seydel's "Ashantee" Pocket Hammock

OSCAR IRVING VAN WART & Co.,
FORWARDING AGENTS.
2 South John Street, LIVERPOOL.

LE COUNT'S

Pat. Machinists' Tools.

REDUCED PRICES.

Set Iron Dogs,	⅜ to 2 in.	$ 5·60
" " "	⅜ to 4 in.	12·00
" Steel "	⅜ to 2 in	6·30
" " "	⅜ to 4 in.	13·00

Iron and Steel Clamps, Die Dogs, Clamp Dogs,

Vise Clamps, Expanding Mandrels, &c.

Send for latest Price Lists to

C. W. LE COUNT,
South Norwalk, Conn.

JOHN MAXHEIMER,

Patented,

June 3, 1862; April 6, 1869; Dec 23, 1873; Jan. 20, 1874; Dec. 22, 1874.

Manufacturer of

JAPANNED and PATENT EUREKA Bright Metal

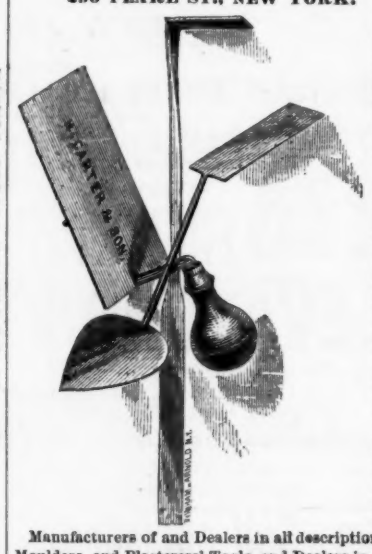
BIRD CAGES.

Nos. 247 & 249 Pearl Street
NEW YORK.

H. CARTER,

290 PEARL ST., NEW YORK.

Moulders' and Plasterers' Tools.



Manufacturers of and Dealers in all descriptions of Moulders and Plasterers' Tools, and Dealers in General Hardware, Gilded Copper Weather Vanes, CARTERS' PATENT CARRIAGE LIFTING JACK, &c

J. CLARK WILSON & CO.

AMERICAN AND FOREIGN

HARDWARE

COMMISSION MERCHANTS,

81 Beekman Street,

NEW YORK

J. CLARK WILSON, W. KUMBEL WILSON, HENRY L. BUTLER JR. ALBERT FERGUSON.

SOLE AGENTS FOR

The Snell Mfg. Co., Augers, Bits, Boring Mach's, &c.
J. L'Hommedieu, Ship Augers and Ship Auger Bits.
Wm. A. Clark, Expansion Bits.
Robert Mann & Co., Chopping Axes.
Middleboro' Shovel Co., Shovels, Spades & Scoops.
Newcomb Brothers, Blacksmith's Bellows.
D. H. Whittemore, Apple Parers, Meat Cutters, &c.
H. Clark, Brad Awl and Tool Sets, Saw Sets, &c.
Merrill's Chisels and Drawing Knives.
McKnight & Kohrer, Axe, Pick, Sledge and Small Handles.
Davis Level and Tool Co., Plumbs and Levels, &c.
Ohio Tool Co., Planes, Handles, Coopers' Tools, &c.
Massachusetts Screw Co., Gimlet Point Screws.
Miller Bros. Cutlery Co., Patent American Pocket Cutlery.
United States Steel Shear Co., Solid Cast Steel Scissors, &c.
American Shear Co., C. S. Shears, Trimmers, &c.
Turner & Cowlishaw, Celebrated Amer. Razors.
H. A. & A. H. Warner, Base Knobs, and Floor Door Fenders.
C. G. Beebe, Cotton Lines.
W. H. Beckensmith, "Eureka" Can Opener.
N. C. Miller, Patent Egg Beaters.
Mrs. H. H. Cole, Patent Fluting Machines.
Taylor Mfg. Co., Door Bells, &c.
Nashua Lock Co., Door Locks, Knobs, &c.

AGENTS FOR

A. & E. H. Sedgwick, Agricultural Tools, &c.
D. Wadsworth & Co., Hay, Straw and Corn Knives, Grass Hooks.
S. A. Millard & Co., Scythes.
E. S. Bachelier, Scythe Snaths, Grain Cradles, &c.
W. C. Barker, Celebrated Scythe Rifles.
Myers & Ervien, Hay, Manure & Spading Forks, &c.
G. S. Lincoln & Co., Molasses Gates.
J. C. Beaty, Butchers' Cleavers and Choppers.
H. A. Lothrop & Co., Trowels, Mincers, Shoe Knives, &c.
Eagle Lock Co., Cabinet and Trunk Locks.
D. Maydole & Co., Nail Hammers, &c.
J. Russell Cutlery Co., Table Cutlery.
Woods Cutlery Co., Hot Water proof Table Cutlery.
Blakemore's Patent Alarm Gongs.
Fisher & Norris, "Eagle" Anvils and Chain Vises.
Wilson Mfg. Co., Wrought Solid Box Vises, &c.
J. M. King & Co., Stocks and Dies.
A. G. Coes & Co., Screw Wrenches.
American File Co., Files and Rasps.
Nicholson File Co., Files and Rasps.
Western File Works, Files and Rasps.
American Butt Co., Cast Butts.
Benedict & Burnham Mfg. Co., Wr't Brass Butts.
Bliss & Drake, Sad Irons, Self Heating Irons, &c.
Oneida Community, Steel Traps.
Union Stone Co., Emery Oil Stones.
Palmer's Patent Door and Gate Springs.
W. Hunt & Co., Razor Strops.

WELLINGTON MILLS LONDON EMERY.

Borax, Glue Oils, Twines Cordage, Emery, Sand, Hardware and Straw Papers, Babbit Metal, White Lead, &c.

Cutlery.

John Russell Cutlery Co.,

FACTORIES AND OFFICE,

TURNERS FALLS, MASS.

Manufacturers of

TABLE CUTLERY,

Butcher, Painters' and Druggists' Knives

IN GREAT VARIETY

Extra Hard Rubber Handle Table Cutlery of our own Manufacture.

Fine Ivoride Handle Table Cutlery, very White and Durable.

Sample Office, 77 Chambers St., N. Y.

NORTHAMPTON CUTLERY CO.,

Manufacturers of all kinds

American Table Cutlery,

Cook, Butcher, Shoe and Hunting Knives. Sole Agents for Rogers' Cutlery Co.

Plated Forks and Spoons. **THEODORE WEED, Manager, 45 Murray Street, N. Y.**

FRIEDMANN & LAUTERJUNG,

MANUFACTURERS OF

Pen and Pocket Cutlery, Solid Steel Scissors, F. & L. Shears, Razors, Russia Leather Strops, Oil and Water Hones, &c.

Sole Proprietors of the renowned full concaved patent

"ELECTRIC RAZORS."

Also Agents for the BENGALL RAZORS.

American Table Cutlery, Butcher Knives, &c.

14 Warren Street, NEW YORK. 423 N. Fifth Street, ST. LOUIS, MO.

TABLE KNIVES AND FORKS OF ALL KINDS,

AND EXCLUSIVE MAKERS OF

And the "**Patent Ivory**" or Celluloid Knife. These Handles never **get loose**, are not affected by **hot water**, and are the most **durable knives** known. Always call for the Trade Mark "**MERIDEN CUTLERY COMPANY**" on the blade. Warranted and sold by all dealers in Cutlery, and by the MERIDEN CUTLERY CO., 49 Chambers Street, New York.

THE MILLER BROTHERS CUTLERY CO.,

Manufacturers of

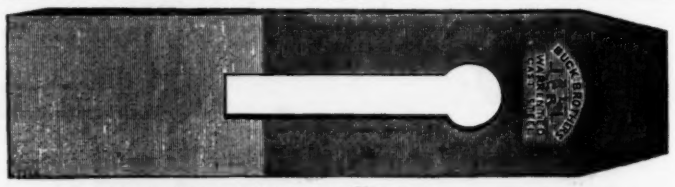
PATENT FINE PEN & POCKET CUTLERY

WEST MERIDEN, CONN.

The **only Knives made** that are put together in such a manner that there is no strain on the covering or frail part of the knife. We warrant our knives equal in cutting qualities and workmanship to any made, and are acknowledged by English makers as the **Best American Knife.** We also make

NICKEL & SILVER PLATED POCKET KNIVES

which will not rust or become discolored when used as a Fruit Knife, and their cutting qualities are equal to any other knife. Orders filled from the factory, and in New York by **Messrs. J. Clark Wilson & Co.,** No. 81 Beekman Street (who have a full stock of all patterns always on hand), and also by **Messrs. G. B. Walbridge & Co.,** No. 99 Chambers Street.



BUCK BROTHERS, Millbury, Mass.

The most complete assortment in the U. S. of **Shank, Socket Firmer, and Socket Framing Chisels,**

PLANE IRONS.

Gouges of all lengths, and circles beveled inside or outside. Nail Sets, Scratch and Belt Awls, Chisel Handles of all kinds. Orders filled promptly; generally same day as received.

ROGERS & BRO.,

MANUFACTURERS OF THE

Celebrated Silver Plated Goods,

FORKS, SPOONS, HOLLOWWARE, &c.,

STAMPED

"ROGERS & BRO. A 1,"

which they are now offering at greatly reduced prices.

Price Lists and Discounts mailed on receipt of business card or reference. Address

P. O. Box 320. 203 Broadway, New York

ESTABLISHED 1854.

NEW YORK KNIFE CO.

MANUFACTURERS OF SUPERIOR

Table & Pocket Cutlery,

WARRANTED TO BE MADE OF THE BEST MATERIAL.

WALKILL RIVER WORKS,

Walden, Orange Co., New York.

THOS. J. BRADLEY, President.

AMERICAN PEN AND POCKET KNIVES,

MANUFACTURED BY Aaron Burkinshaw. AB *PEPPERELL,* MASSACHUSETTS

My Blades are forged from the best Cast Steel, and warranted. To me was awarded the GOLD MEDAL of the Connecticut State Agricultural Society; also a Medal and Diploma from the Mass Mechanics' Ass'n Sept., 1869

Wood's Hot Water-Proof Table Cutlery.

Handsomest, Cheapest, most Durable Cutlery in use.

Wood's Celebrated Shoe Knives. Butcher Knives a specialty.

WOODS CUTLERY CO., Antrim, N. H.

CLARK WILSON & CO., Agents, 81 Beekman St., N. Y.

ROMER & CO.,

Established 1837.

Manufacturers of **Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plain and Sewing Machine Locks.**

141 to 145 Railroad Avenue, NEWARK N.J.

Illustrated Catalogues sent on application.

Cutlery.

KING, BRIGGS & CO.
80 CHAMBERS ST. NEW YORK
ENGLISH
HARDWARE.
WOSTENHOLM'S
IXL
POCKET KNIVES,
KNIVES & FORKS,
RAZORS,
SCISSORS, FILES, CHAINS
ANVILS, VISES
GUNS.

JOSEPH S. FISHER,

No. 411 Commerce St., PHILADELPHIA

AGENT FOR

George Wostenholm & Son,

Washington Works, SHEFFIELD,

Celebrated I-XL Cutlery, Razors, &c

AGENT FOR

WALTER SPENCER & CO.,

Steel and File Manufacturers,

Rotherham, ENGLAND.

Corporate Mark.

SPENCER ROTHERHAM

Granted 1777

RICHARD A. TURNOR,

78 Chambers St., New York,

Agent for

F. W. HARROLD

Hardware & Cutlery,

BIRMINGHAM.

JOSEPH ELLIOT & SONS,

Manufacturers of Razors, Table Knives, &c.,

SHEFFIELD.

CORPORATE MARK,

Joseph Rodgers & Sons'

(LIMITED)

CELEBRATED CUTLERY,

No. 82 Chambers Street, New York.

CHARLES PEACE, Jr., Agent.

The demand for **Joseph Rodgers & Sons'** productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam Power.

To distinguish Articles of **Joseph Rodgers & Sons'** Manufacture, please to see that they bear their Corporate Mark.

ASLINE WARD,

101 and 103 Duane Street, N. Y.

REPRESENTING

GEO. WOSTENHOLM & SON,

CUTLERY AND RAZORS,

Washington Works, Sheffield.

CORPORATE MARK.

I X L

FREDERICK WARD & CO., Sheffield,

Cutlery and Table Knives.

CORPORATE MARK.

B4 * ANY

R. HEINISCH'S SONS,

(Successors to R. HEINISCH)

Manufacturers of their

Patent Tailors' Shears.

SCISSORS AND TRIMMERS.

301 Broadway, *NEW YORK.*

FURNESS, BANNISTER & CO.

Manufacturers of

Fine Table CUTLERY.

Cor. Nassau & Sheffield Sts.,

NEWARK, N. J.

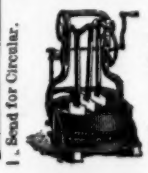
W. R. OSTRANDER,

Manufacturer of **THE BEST**

ALARM WHISTLES, SPEAKING TUBE, ELBOWS, ETC.

Fitting up Speaking Tubes a specialty.

19 Ann Street, **NEW YORK**



1. Send for Circular.

"DRAW CUT"

BUTCHERS' MACHINES.

Choppers, Hand and Power.

Stuffers,

Lard Presses.

Warranted thoroughly made and the BEST IN USE.

MURRAY IRON WORKS,

Burlington, Iowa.

PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, June 28, 1875.

Nothing more was wanted to squelch the small amount of business doing in this city than the terrible heat which has existed for the last half of the past week. With the thermometer at 100° in the shade, and from 15° to 20° higher in the sun, trade languishes, production must pause, and speculation ceases altogether. Still, the week presents its share of gossip, some of which is of interest. An additional impetus to the Centennial cause was given by the meeting and visit of the bankers of the country to the grounds, and the formation of a numismatic association for a proper display of the coins and currency of the country during the century. The bankers did more than this, though, they thoroughly inspected the grounds and buildings, they indorsed the action of the commission, and they pledged themselves to use their influence throughout the country to secure the funds still necessary for the completion of the work. This is the strongest and most solid influence yet brought to the aid of the cause, and will be of very great service in the end. Although the subject is noted daily, and almost *ad nauseam*, it is necessary for the interests of all that the progress of affairs shall be reported from time to time. In this progress, therefore, we have to chronicle a contract which has just been closed by the managers with a passenger railway company here, by which they are to construct and operate within the Exhibition grounds a double track narrow gauge railroad, which will traverse the entire circle between the various buildings, a distance of some three and a half miles. This road is to be equipped with five locomotives and forty palace cars, all of which are tendered the company free of cost by different locomotive and car builders of the country. While this will be a great accomodation in affording means of transit to visitors, it will also be a splendid advertisement to the shops furnishing the cars and engines. It is also a suggestion to numerous manufacturers of all sorts of conveniences and comforts to the public, to place them at the disposal of the commission to be used throughout the grounds, thus accommodating the visitors and benefiting themselves at the same time.

A very important railroad enterprise, and one which has included some very extraordinary engineering work, has been completed and opened during the past week, with less notice than it deserves. This is the extension of the Lehigh Valley Railroad, known as the Easton and Amboy Road, connecting the Lehigh Valley Road at Phillipsburg, on the Delaware, with tide water, and practically with ocean navigation, at Perth Amboy, N. J. The history of the construction of this road is remarkable, since it included not only that of one of the greatest engineering works of the day, the Musconetcong Tunnel, but that the entire road was built without the creation of any bonded debt whatever, the latter surely a feature which will commend itself in these days of slippery railroad finance. The road was begun in 1871, surveys being made by Mr. Robert H. Sayre, the chief engineer of the Lehigh Valley Company, and assistants. At Easton, the Pennsylvania terminus, is the bridge connecting the road with the Lehigh Valley R. R. track, and although still unfinished, is a splendid iron trellis bridge, 1200 feet long, crossing the Delaware River. Two miles from Phillipsburg is an iron viaduct 381 feet long, crossing the Morris and Essex Canal, at an elevation of 125 feet. Beyond this is the Springtown embankment, which is one of the greatest "fills" in railroad history. This stretches across a valley 1700 feet wide and is 127 feet high, requiring 550,000 cubic yards of filling. Through it is a double arch culvert of 13,000 cubic yards of masonry, 400 feet long, with arches of 34 feet span, admitting water courses and a roadway. Although more costly than a viaduct it is economical by reason of permanency. Another embankment of 400,000 cubic yards at Pine Hollow shows the magnitude of the work. Next on the line is the Musconetcong Tunnel, which, with the exception of the Hoosac, is the greatest engineering feat on the Atlantic slope. The opening of this tunnel was reported at the time, although it is really but just finished. It was begun April 19th, 1872, and work has been steadily driven since. Three times the working force was driven out by water, while the rock and other difficulties made it a greater job than the Hoosac Tunnel. Beyond the tunnel the road presents no especial features until the coal wharves of Perth Amboy are reached. These are models of construction, built on piles 30 feet above the ground; 1500 feet in length by 75 feet wide. On each side chutes give access to an extended system of tracks, all connected by the Lorenz switch, the invention of Mr. William Lorenz, the chief engineer of the Philadelphia and Reading Railroad, and now in use on most of the roads in the country. On these wharves 20,000 tons of coal can be handled daily, and two more of similar capacity are being finished. The road gives the Lehigh Company an outlet to the sea for their coal over their own track, and also gives railroad facilities to a very thriving region of country. As an engineering work it is extremely interesting, and as a new feeder for coal to New York and New England, highly important.

The commencement exercises of the University of Pensylvania, held during the week, bring out the interesting facts of the reception of that institution of bequests during the year equal to $1,100,000, exceeding those made to any other college in any one year, and also more than this has received in the whole one hundred and twenty years of its existence. Further, it announces the opening of the Towne Scientific School, under the charge of Professor Lesley, as Dean. This department will commence September 15, 1875, and the course of study will include chemistry and metallurgy, geology, civil and dynamic engineering, physics and architecture. The synopsis shows that this curriculum is to be very thorough, and especially so in analytical chemistry and metallurgy, in the latter of which is included the construction and management of blast furnaces and engines. The bequest of the founder of this school enables the faculty of the University to supply the only department hitherto wanting in the course, and which was especially needed in this city. A curious movement is announced from the Granger's headquarters at Washington, which is an arrangement to create a system of international exchange between the Co-operative Societies of Great Britain and the Patrons of Husbandry here. The movement originates abroad with the Central Co-operative Board of Great Britain, which states the object to be to "reform abuses, get rid of middlemen, restore commercial integrity, equalize wealth, etc." It represents that much greater quantities of American products would be sold in England but for extravagant charges of middlemen, and that the same is true of manufactured articles sent to America from England. The plan of co-operation proposes direct trade in their own ships freighted with English goods to exchange for the grain and cotton of the Granger on equitable terms. There are 500,000 members of the co-operative societies of Great Britain, and 2,000,000 Grangers in the United States, hence we may argue that 2,500,000 people, if this movement was practicable, would expect to do the entire business of the English speaking people of the two countries, which, although highly euphimistic on their part, is "a trifle gauzy" to practical people. Once more we have a machine to make pressed fuel from coal dust, said to be practical, the invention of Dr. Hayes, of Harrisburg, and tested first this week. By it "a ton of coal was made in six minutes, and as it is simple, cheap and universally practicable, it will add, it is hoped, millions of dollars to the coal wealth of Pennsylvania;" when I know more of it I will report. The Southwark Iron Works of Henry G. Morris, lately bankrupt, was to have been sold at auction, including tools, plant etc., this week, but the sale was postponed under injunction granted mortgagees.

The Pennsylvania Railroad Company has just placed on the track a locomotive capable of drawing 100 loaded cars in train, and seven tons heavier than the Modoc, whose power is double that of an ordinary engine. Although severe on the road-bed, the use of steel rails and first-class construction admits the adoption of such mammoth engines, which are economical in reducing cost of traffic.

Metallurgy in Japan.

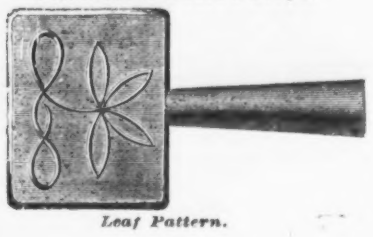
In a thesis prepared by a Japanese student, just graduated at Rutgers College, we find the following: Iron ores are very abundant in the Japanese Islands. The chief ores of Japanese iron industry are magnetic iron ore, specular iron ore and brown hematite. The first is found in two varieties, one of iron-gray color and the other black. Masses of this ore in the state of magnetic polarity, generally called lodestones, are found in the eastern part of Nipon, Sendai and Nambu. They are very highly esteemed for the steel manufacture, for swords and compass needles. Japanese furnaces are small in size and simple in structure, although the principle is the same as that of the blast furnace used here and in Europe. The walls of the Japanese furnace are built with fire-proof clay, and sometimes with a few stones. The shape of the furnace is round at the bottom, having at one side an opening which is closed with a clay stopper. On the opposite side of the furnace wall, a little above the bottom, there are two openings through which a continuous stream of air is passed into the furnace by means of a Chinese bellows worked by men. Before the ores are put into the furnace they are piled up in heaps with coal and calcined, or roasted, so that the water, carbonic acid, and sulphur may be expelled. The Japanese do not know the theory of the puddling process used in the Western countries, but the principle is exactly the same. The cast iron mixed with some sand and some iron scales is melted, with charcoal heat in a furnace similar to that already described, and kept in this melted state for several days until the whole mass assumes a fluid appearance. The Japanese method of steel making is entirely different from those usually employed in Western countries. It is done in this way. They mix a certain quantity of pig iron, which contains too great a quantity of carbon, with a certain quantity of bar iron, which has too little carbon, and cover the mass with borax and smelt in a small crucible of fire proof clay for more than a week. The borax is used to dissolve any impurities in the slag. When the metal is separated from the slag floating on the surface, it is taken out and hammered hard, and alternately cooled in water and oil for many times. After the steel has been cast in that method, it is cemented and tempered. The method of cementing consists in covering thickly the hammered steel with a liquid mixture of clay, loam, ashes and charcoal powder. When this layer is dried the whole is heated red-hot and then cooled very slowly in warm water. The steel is now ground on a whetstone. The steel thus made is not very elastic, but is very hard. The explanation is that either the Japanese do not understand the tempering process, or they are unable to remove entirely the impurities from the steel. I have often heard Japanese blacksmiths say that watch springs can never be made in Japan, for Japanese steel is not elastic. The Japanese take great care and time in steel manufacture for swords. For instance, for ordinary knives forging and cooling are to be done only four times, but for swords fifteen times. Copper is and will be the most important metal of Japan. It is found in almost every province. For roasting they have a loamy furnace covered with a shed, provided near the bottom with several openings for the draft of the air. Five alternate layers of ore and wood are placed in the furnace and burned.

The Canton (O.) Wrought Iron Bridge Company have now under contract over $160,000 worth of wrought iron bridge work. The work done in this establishment last year ran over $400,000. They are now building a railroad bridge in Iowa, also one at Saginaw with 200 feet swing and 160 feet truss; span to be on wrought cylinder piers, no cast iron being used in railroad bridges. This company have bridges in twenty-five different States, the aggregate length of which will measure 28 miles. Their shops are conveniently situated on the line of Pittsburgh, Fort Wayne and Chicago Railroad, with every facility for rapidly turning out and shipping bridge work, the capacity being 150 feet per day.

The London *Times* of the 7th inst. says that large quantities of mowing machines and other implements, nuts, bolts etc., from the United States, are being sold in Birmingham at prices considerably under those of corresponding goods of English make, and that even Spain is now successfully competing with Staffordshire hinge makers in their own district. Belgium, also, is sending England railway spikes, iron foundry dog chains, etc., and excellent Prussian wire is offered at from ten to twenty per cent. under Staffordshire and Lancashire prices

H. D. SMITH & CO., PLANTSVILLE, CONN.

Patent Embossed Steps.

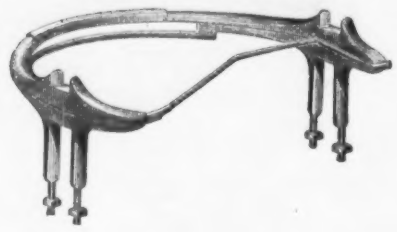


Leaf Pattern.

Established 1850.

King Bolt Yokes.

No. 6 Fifth Wheels.

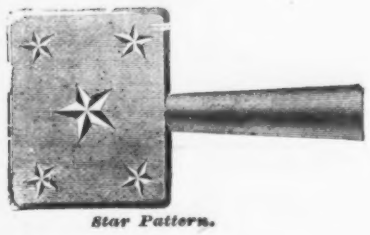


1871 Pattern Shaft Couplings.

Patent Cross Bar Steps.

Upper View.

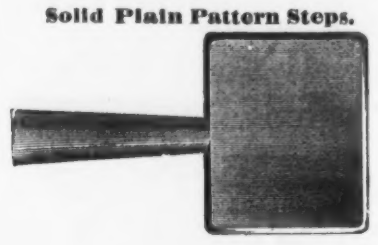
Lower View.



Star Pattern.

Smith's Improved Philadelphia Pattern Slat Irons.

Solid Plain Pattern Steps.



MANUFACTURERS OF A LARGE VARIETY OF FIRST-CLASS

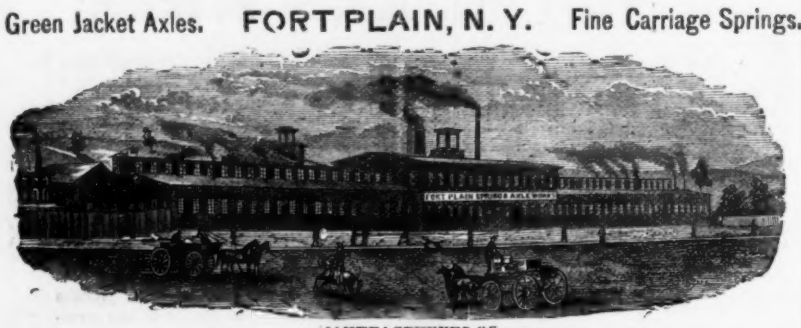
FORGED CARRIAGE IRONS.

Send for Price List.

FORT PLAIN SPRING & AXLE WORKS

CLARK, SMITH & CO.,

Green Jacket Axles. FORT PLAIN, N. Y. Fine Carriage Springs.



MANUFACTURERS OF

English and Swedes Steel Springs, and Iron and Steel Axles.

Execute orders promptly for

Black, Bright, Tempered and Oil Tempered Springs,

Of any Pattern or Style. Also for **AXLES of any description, from a COMMON LOOSE COLLAR to the FINEST OF STEEL.**

Our facilities for manufacturing are very extensive, and with our recent additions of new and improved Machinery, we defy competition.

Send for Price List and Descriptive Circular.

CARRIAGE BOLTS.

Buy the Best.

Clark's Patent Carriage Bolt.

Best Bolt manufactured for all kinds of agricultural machinery. Will not split the wood, and can not turn in its place.

MANUFACTURED BY

CLARK BROS. & CO., Milldale, Conn.

Also Manufacturers of

Plow and Machine Bolts, Coach Screws, Nuts, Washers, Tire Blanks, Rivets, &c

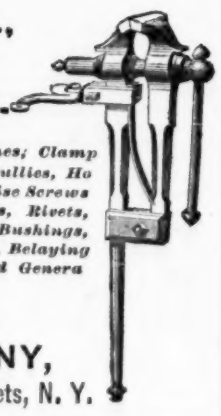
Send for Illustrated Price List

WILSON MANUFACTURING COMPANY.,

NEW LONDON, CONN.

MANUFACTURERS OF

SOLID BOX VISES.



With or without Convex and Concave Washers.

Jackscrews, Braces, Coffee Mills, Turning Lathes; Clamp Heads and Screws; Parallel Bench Vises, Sash Pullies, Ho House Pullies, Composition Cocks, Bench Screws, Vise Screws Gridirons, Drill Stocks and Bows, Box Chisels, Rivets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Marlin Spikes, Malleable Iron Castings, and Genera Hardware.

GALVANIZING DONE TO ORDER.

WILSON MFG. COMPANY,

Warehouse, 97 Chambers and 81 Reade Streets, N. Y.

HOOPES & TOWNSEND,

Manufacturers of

MACHINE & CAR BOLTS,

Cold Punched Square & Hexagon Nuts,

Washers, Rivets, Wood or Lag Screws. Chain Links, Truck and Car Forgings, Bridge Bolts, Bridge Forgings.

IRONS AND RODS FOR BUILDINGS.

1330 Buttonwood Street. PHILADELPHIA.

Philadelphia Star Bolt Works.

"STAR"

Carriage and Tire Bolts,

From the Best Brands of

NORWAY IRON.

Trade Mark.

The Celebrated

"STAR" Axle Clip.

All Styles of

FANCY HEAD BOLTS.

Blank Bolts, Skein Bolts, Square Head Bolts, Plow Bolts, &c., &c., &c.

TOWNSEND, WILSON & HUBBARD, 2301 Cherry St., Philadelphia, Pa

Old Colony Rivet Works.

Rivets, Nuts, Washers, Lag Screws, Coleman's Eagle Carriage and Tire Bolts, Axle Clips, Felloe Plates, Shaft Couplings, Stove and Machine Bolts, Driling Machines, Tire Benders,

&c. Full stock constantly on hand. Warehouse, 34 Warren St., N. Y.

ESTABLISHED 1837.

H. M. WENTWORTH & CO.

MANUFACTURERS OF

Carriage Springs & Axles

DAM, NO 3 WATER ST, **Gardiner, Me.**

ALL GOODS WARRANTED.

GALVANIZED

Malleable Iron Tackle Blocks

All Sizes from 1 1-2 to 7 inch.

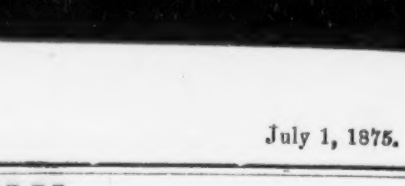
Manufactured and for sale by

W. & J. TIEBOUT, 290 Pearl St., N. Y.

MANUFACTURERS OF

Brass, Galvanized and Ship Chandlery

HARDWARE.



ARMS, BELL & CO.,

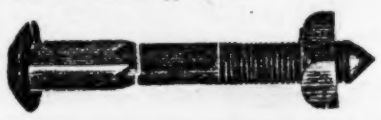
Manufacturers of

Carriage, Tire & Square Head Bolts.

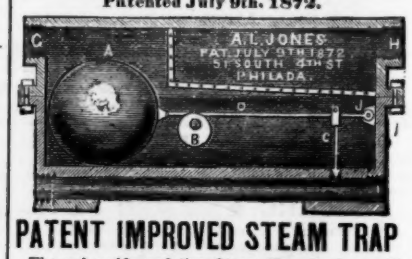
Cold Pressed Nuts and Washers, Etc.,

YOUNGSTOWN, OHIO.

Price lists sent on application.



Patented July 9th, 1872.



PATENT IMPROVED STEAM TRAP

The only self-regulating Steam Trap in the world. For full description send for circular to

A. L. JONES,

Steam Heating Establishment, 51 S. 4th treet Philad

Alexander Brothers,

Manufacturers of **OAK TANNED**

LeatherBelting

410 & 412 North 3d, Philadelphia, Pa.

CHARLES W. ARNY,

Manufacturer of the Best

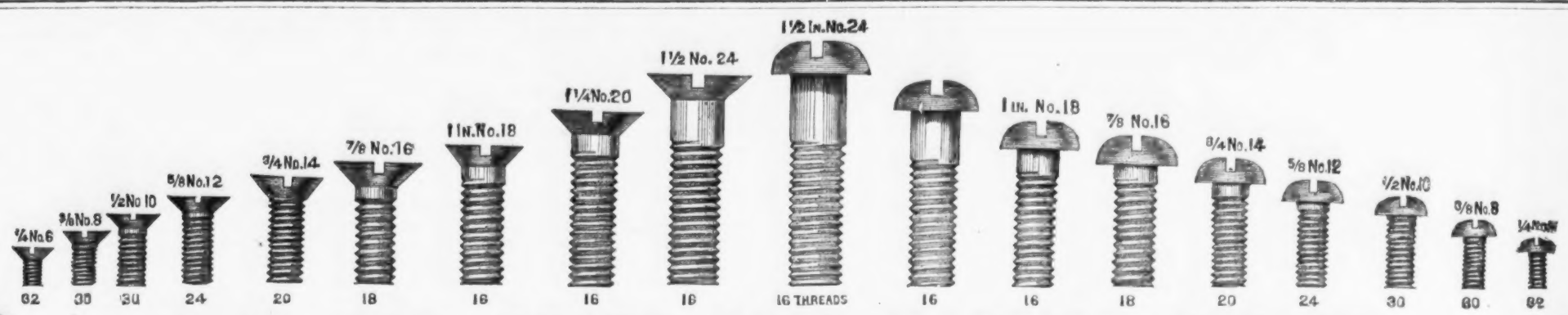
Oak Leather Belting,

AND

FAUGHT'S

Patent Round Braided Belting,

301 & 303 Cherry Street, PHILADELPHIA.



FLAT AND ROUND HEAD MACHINE SCREWS,

OF SIZES, Nos. - - 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, SCREW GAUGE.
AND LENGTHS - - ¼, ⅜, ½, ⅝, ¾, ⅞, 1, 1¼, 1½ INCH.

PLUG AND BOTTOMING TAPS.

Manufactured, **KEPT IN STOCK**, and sold by

AMERICAN SCREW COMPANY, - - PROVIDENCE, R. I.

Fillister Head and Pattern Machine Screws Made to Order Promptly.

11 Warren Street, N. Y.

H. B. NEWHALL,

Agent for the Following Companies:

EMMET HAMMER CO.,

Manufacturers of all kinds of

Hammers and Sledges and Contractors' Tools.

H. B. NEWHALL, Agent.

All our goods are branded "E. F. EMMET & CO., Brooklyn, N. Y." None genuine without the above brand.

MACHINIST Ball, Straight and Cross Pene Hammers.
BLACKSMITH, Hand and Riveting Hammers.
" Sledges, Swages, Fullers, Flatters, hot and cold Chisels.
HORSE SHOERS' Turning and Shoeing Hammers, Sledges, Pincers.
MINERS' Striking and Drilling Hammers.
QUARRY Sledges, Macadamizing Hammers.
MASONS' Hammers, Brick Hammers.
BOILERMAKERS' Riveting and Flogging Hammers.
COOPERS' Hammers, Drivers and Stakes.
RAILROAD and **SHIP SPIKE** Mauls, &c., &c.

All kinds of

ANVIL TOOLS and STEEL FORGINGS

Made to order at short notice.

WM. H. HASKELL & CO.,

Pawtucket, R. I.

Manufacturers of

COACH SCREWS (with Gimlet Point),

all kinds of

Machine and Plow Bolts,

FORGED SET SCREWS AND TAP BOLTS.

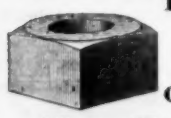
H. B. NEWHALL, Agent.

THE READING BOLT AND NUT WORKS,

J. H. Sternbergh, Reading, Pa.
Manufacturer of

MACHINE BOLTS.

Bridge,
Roof,
and
Car Bolts.



Hot Pressed Nuts,

Washers, Wood or Lag Screws, Refined Bar Iron, &c.
H. B. NEWHALL, Agent, 11 Warren St., N. Y.
S. H. & E. Y. MOORE, Agents, 68 Lake St., Chicago, Ill.
POST & CO., Agents, Cincinnati, Ohio.

Penfield Block Works,

LOCKPORT, N. Y.

Manufacturers of

The "ANCHOR" Brand of

TACKLE BLOCKS,

Rope and Iron Straps,

Steel Pins, Common & Patent Bushings.

HORSE HAY FORK BLOCKS,

New this year, and Cheap, with [illegible]

OUTSIDE (ROUND) IRON STRAPS.

Inside Iron Strap—A Superior Block.

Outside (Round) Iron Strap—New and Cheap

AMERICAN BOLT COMPANY,

MANUFACTURE

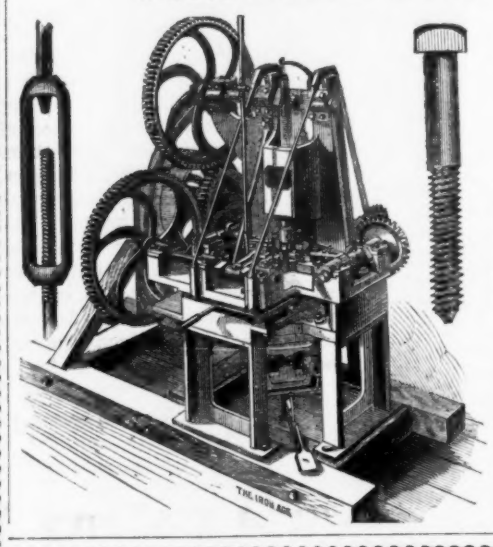
BOLTS AND NUTS!

Coach or Lag Screws, Washers, Chain Links, Forgings, &c.

OF ALL KINDS AND SIZES, AT SHORT NOTICE.

210 Lawrence St., Lowell, Mass.

JONATHAN HOPE. ROBERT H. BUTCHER. JAMES MINTER



With increased facilities we are now enabled to pay prompt attention to all orders for our **Patent Bolt Heading Machine,** now fully acknowledged the best ever invented. Our Machines will head Bolts from ⅜ inch diameter to 1⅛ diameter, and from ½ inch to 48 inches long, or longer if necessary, and almost any description of heads—Square, Hexagon, T head, &c. and properly attended, without changing, will head from 300 to 500 per day. We are also prepared to offer for sale our **New Patent Bolt Cutter,** which will cut Bolts from ⅜ inch diameter to 1⅛ inclusive. A boy will cut on an average 400 ¾ inch Bolts per day. Parties wishing first class Bolt Heading Machines or Bolt Cutters, we would respectfully invite to call at our works, where they can at all times see the Machines in operation and judge for themselves. Perfect satisfaction guaranteed in all cases. For references and any other information in regard to the above, apply to the **American Bolt Co., Lowell, Mass.**

O. W. LEONARD, 40 John St., Sole Agent for New York and vicinity.

Providence Tool Co.,
PROVIDENCE, R. I.
Lewis, Oliver & Phillips,
PITTSBURGH, PA.
Reading Bolt and Nut Works,
READING, PA.
Wm. H. Haskell & Co.,
PAWTUCKET, R. I.
Penfield Block Works,
LOCKPORT, N. Y.
Adamantine File Works,
PROVIDENCE, R. I.
Emmet Hammer Co.,
BROOKLYN, E. D., N. Y.

DEAN'S New Patent (1873)

Screening Scoop

SHOVEL

For Coal, Coke and Coal Ashes, and other Substances.

atented in United States and England, 1872.

The largest frames are 12 by 18 inches, with seven bars, and are made of the Best Malleable Iron. They are, or can be, wired between bars by an arrangement of holes a quarter of an inch apart, by an ordinary person, to screen any size substance desired. They are warranted to be the most durable and practical Screening Shovel made, or money refunded.

Reference—All New York Gas Companies and Hotels.

☞ Smaller sizes on hand.

Please address orders to

A. SEE & SON,
N. Y. Shovel Works,
1358 Broadway, N. Y.

Price: Largest size $30 per doz., and upwards, according to size of spaces.

Many & Marshall,

48 Warren St., N. Y.

SASH CHAIN.

Chain and Pulley for Heavy Sash.

THE BEST & CHEAPEST MADE.

Manufacturers of every description of

BUILDERS' HARDWARE,

Pure Bronzed Metal and Hand-Plated Knobs, Hinges, &c.,

Agents for Gautier's Black Lead Crucibles.

Agency and Depot of the TRENTON LOCK COMPANY.

EAGLE BOLT WORKS.

(ESTABLISHED 1845.)

No. 2030 Arch St., PHILADELPHIA.

THE ORIGINAL AND ONLY ESTABLISHMENT MANUFACTURING THE

Genuine Eagle Bolt.

AND USING SQUARE NORWAY IRON EXCLUSIVELY.

Carriage Bolts of every description, *Pointed* Tire Bolts, Square Head Bolts, Countersunk Bolts, Cone Heads, Steeple Heads, T Heads, Cheese Heads, Elliptic Heads, Step Bolts, Axle Clips, Turned Collars, California Tire Rivets and Washers constantly on hand, and orders filled promptly.

☞ IMPROVED "EAGLE" BED SCREWS. ☜

For Price Lists and Discounts, Address

THE M. J. COLEMAN BOLT AND NUT COMPANY,

(Successors to M. J. COLEMAN,)

No. 145 Columbia Avenue, below Second Street,
(Late 2030 Arch Street,)
PHILADELPHIA.

A complete assortment at OLD COLONY RIVET WORKS, 34 Warren Street, N. Y

The Iron Age.

New York, Thursday, July 1, 1875.

DAVID WILLIAMS - *Publisher and Proprietor.*
JAMES C. BAYLES - *Editor.*
JOHN S. KING - - *Business Manager.*

NEW YORK, January 2, 1875.

Until the 1st instant the postage on newspapers was paid by subscribers at the office where the paper was received, the yearly rates on the different editions of *The Iron Age* being as follows: Weekly, 40 cents; Semi-Monthly, 40 cents; Monthly, 24 cents.

Under the provisions of the new postal law, which went into effect on the 1st instant, prepayment at the office of mailing is required, at the rate of two cents per pound for the Weekly, and three cents per pound for the Semi-Monthly and Monthly, which will make the postage as follows on the different editions: Weekly, 50 cents; Semi-Monthly, 30 cents; Monthly, 15 cents.

Our rates of subscription will therefore be as follows:

Weekly Edition.....**$4·50 a year.**

Issued every THURSDAY Morning. Contains full Trade Reports for the week, brought up to the close of business on the previous day.

Semi-Monthly Edition.....**$2·30 a year.**

Issued the FIRST AND THIRD THURSDAY of every month. Contains a full Review of the Trade for the previous half month.

Monthly Edition.....**$1·15 a year.**

Issued the FIRST THURSDAY of every month. Contains a full Review of the Trade for the previous month.

To Foreign Countries.

Including Postage.

To	Weekly.	Semi-Monthly.	Monthly.
Canada	$4 50	$2 30	$1 15
Cuba	5 04	2 52	1 26
Great Britain	6 08	3 04	1 52
France	7 12	3 56	1 78
Germany	6 08	3 04	1 52
Prussia	6 08	3 04	1 52
Buenos Ayres	8 16	4 08	2 04
Peru	6 08	3 04	1 52
Belgium	6 08	3 01	1 52
Mexico	8 68	4 34	2 17
Sweden	6 08	3 04	1 52
New Zealand	8 16	4 08	2 04
Brazil	8 68	4 34	2 17

ADVERTISING.

One square (12 lines, one inch), one insertion, $2 50; one month, $7·50; three months, $15·00; six months $26·00; one year, $40·00; payable in advance.

All communications should be addressed to

DAVID WILLIAMS, Publisher,
10 Warren Street, New York.

EUROPEAN AGENCY.

CHARLES CHURCHILL & Co., American Merchants, 98 Wilson Street, Finsbury, London, England, will receive subscriptions (all postage prepaid by us) at the following prices in sterling: Great Britain and France, 25/; Germany, Prussia and Belgium, 23/4; Sweden, 20/. They will also accept orders for advertisements, for which they will give prices on application.

City Subscribers will confer a favor upon the Publisher, by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age*; also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in hall ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

CONTENTS.

First Page.—Improvement in Screw Cutting Machinery. The Government Tests of Iron and Steel. Working Heavy Grades in Switzerland. California Borax. The Brown Iron Company's Works. A Dead Blast Furnace.

Third Page.—Sound Castings.

Fifth Page.—New Chimney Cowl. Saving Life at Sea. Compression in Casting. Lead. Roman Kitchen Utensils.

Seventh Page.—Cheaper Stock for Pennsylvania Furnaces. The Jackson Iron Company. New Electric Clock. The Copper Cent. Rapid Process for the Detection of Lead in the Tin Lining of Vessels.

Ninth Page.—Business Items.

Eleventh Page.—Philadelphia Correspondence. Metallurgy in Japan.

Fourteenth Page.—American Iron for Export. The Lead Markets. Car Building Practice.

Fifteenth Page.—Service Pipes. Coal and Iron in the United States. Plating with Aluminum.

Nineteenth Page.—Influence of Mining Industries on Civilization. Extraordinary Specimen of American Sheet Iron.

Twentieth Page.—The Watson Bridge Works Burned. Iron Manufacture in California.

Twenty-first Page.—Trade Report.

Twenty-Second Page.—Trade Report.—(continued).

Twenty-third Page.—Our English Letter. Paints for Engineering Structures. Manufacturing Charcoal.

Twenty-fourth Page.—Manufacturing Charcoal—(continued). Roman Aqueducts and Baths.

Twenty-seventh Page.—The Iron Age Directory.

Twenty-eighth Page.—Petroleum in Iron Manufacture.

Thirtieth Page.—New York Wholesale Prices of Hardware and Metals.

Thirty-first Page.—New York Wholesale Prices (concluded).

Thirty-fifth Page.—Philadelphia, Buffalo, Cincinnati, Pittsburgh and Detroit Hardware and Metal Prices.

Thirty-seventh Page.—Chicago, Boston, and St. Louis Hardware and Metal Prices.

American Iron for Export.

"Merchants are selling American Iron "at Wolverhampton at $35 per ton." So says an Associated Press dispatch under date of June 24th. The item will probably surprise a great many of our readers, especially those who have doubted the practicability of exporting pig iron from this country to foreign markets. Of course, all interested are aware that the American iron which merchants are selling at Wolverhampton is charcoal pig iron, and that the price named leaves a fair but small margin of profit. Nevertheless, such a telegram at any time within the past three years previous to 1875 would have excited in the minds of the public a degree of astonishment which will not now be the case, because of the general knowledge of the people that our imports from Great Britain of raw irons have almost ceased, and that we can supply certain grades of the same material to that country on better terms than can be obtained elsewhere. The inception of our iron shipments to England has been the source of so much discussion as to need no repetition here. Like all new ventures on a foreign market, our charcoal iron shipments were regarded with distrust and doubt as to the quality of the metal, and the usual uncertainty arising from disbelief that the United States could possibly furnish a quantity of charcoal iron capable of competing with Swedish irons in purity. The facts are, that until very recently, notably until after the establishment of the British Iron and Steel Institute, the English iron master was in profound ignorance not only of the American iron trade, but particularly of the production of charcoal irons with us, and the quality of the metal made. The history of the reception of the first shipments made this season, as given us from private letters from parties conversant with the matter, is as follows: The first lots were disposed of with difficulty, as was perfectly natural, in ten ton samples as "flyers," to use brokers' parlance. The first, or nearly so, if we remember aright, went to an agricultural machine works for admixture. This order was supplemented by others for more of the same iron, and the Liverpool brokers and iron merchants were besieged with correspondence as to quality, price, etc., of the new iron. Subsequent shipments resulted in a better reception, and the uses of American iron possessing good chilling properties was to a certain extent adopted for certain castings, while some of it found its way to the crucible steel works. So far as we are informed no attempt has yet been made in any instance to adopt our iron for car wheels, nor, despite the recommendation of numerous influential journals, is there any progress toward the introduction of the American form of chilled iron car wheel. Should, indeed, such occur, it is more than probable that the experience of the American wheel founders will be taken advantage of, and the finished product imported from the United States at better prices than the wheels could be made in England from American pig. Hence we may not look for any immediate market for charcoal irons in England for wheel purposes. The question of profit, however, has been tolerably well settled in that equally as good prices are obtainable in Great Britain for our Southern charcoal irons as in the home markets, and the probability of a fairly active demand steadily increasing as the merits of the metal become known. Such is the condition of the present charcoal iron trade with England. In various articles, published from time to time previously, we endeavored to contribute to this precise result, and in so doing accomplished what has not hitherto been done, viz., to obtain reliable information as to actual costs of production in the South and Southwest. From the very interesting, graphic and statistical correspondence furnished us on "Charcoal Iron Making in the South," which have been running through our columns for a series of weeks, it appears clearly that charcoal and coke irons are made in that section of the country which, providing the ores are of sufficient purity to insure good quality, can be shipped abroad at a profit unless some extreme advance of freights should take place. The latter is unlikely to affect Southern ports, however, as pig metal can always be supplied under cotton cargoes at low rates. The policy of extending this trade is clearly manifest, as it gives an outlet to a large proportion of our product which would at present otherwise be uncalled for, and also furnishes a substitute for grain exports, which would produce smaller returns or never be made at all.

Whether our export trade will be limited to charcoal irons, or whether we can expect to build up a trade in other grades of pig metal after the wedge is once entered and a trade fairly established with foreign markets, we cannot now predict. We can no doubt make iron which could be used with advantage and profit in European foundries and mills, but whether we can export them or not depends upon the cost of making them in this country. That the present is an inauspicious time to attempt any such exportation is clearly evident, but with any improvement in the English iron market it is quite within the range of possibilities. Against ordinary pig irons the only possibility of competition would be in strength, and in this American irons are far ahead of English, so far, indeed, as not to be considered in the same category. American pig iron has stood a test of 20,600 lbs. to the square inch, as in the case of anthracite iron made by the Powhatan Iron Company, of Richmond, Virginia, while from 1600 to 2000 lbs. less may be considered an average of first-class coke or anthracite irons, charcoal ruling higher. We have not at hand tests of English iron, but from specimens of ship plates left here from repairs to Clyde built ships it is quite evident that the pig from which this had been made could never have approached in strength the figures given. If we can make our irons cheap enough we shall undoubtedly be able to sell them for special uses in foreign markets: if we cannot, it is idle to hope of exporting them, however good they may be.

The Lead Markets.

About six weeks ago the European lead markets, under the stimulus of a demand incident to the menace of war, experienced a sudden upward movement, while this market remained dull and stagnant, with little prospect of a speedy improvement.

Since then the relative position of the markets of both continents has undergone a radical change. In Europe, since the apprehensions of political complications have been allayed, the price has been steadily tending downward, while here more extensive purchases for *bona fide* consumption have followed closely upon a slack spring demand preparatory to an active fall trade. It will be remembered from former statistics of ours that the world's normal lead production sums up something like 300,000 tons, toward which England contributes 70,000; Spain, 67,000; Germany, 49,000; the United States, 46,500; Italy, 23,000; France, 17,000 (mostly from Spanish ores); while the remaining countries furnish 27,500. Thus, of the larger producers France turned out the least, and even this little was in the main derived from the neighboring Peninsula. Yet France has at all times been one of the largest consumers, and its dependence on other countries for a supply has been anything but a comfortable fact in the appreciation of the French people. The subject has engaged the attention of Frenchmen, and some long abandoned lead mines of Brittany of unusual richness are now to be made to yield some good returns. Mining operations near St. Brieuc were commenced by the ancients, who carried on their works on an extensive scale, though, of course, in a very imperfect manner. The works were partially resumed about eight or ten years since, when a steam engine was erected, the shafts and levels cleared and repaired, and about 60 tons of ore sold, some of which realized at Swansea over £37 per ton. The proprietors, however, became involved in the panic of 1866, the works were abandoned on the eve of success, and the mine allowed to fill with water. Some two years ago another attempt to re-open the mine was made, and some 60 tons of ore were raised and sold, which satisfied those concerned that the property was worth energetic development.

Other mines in the same locality seem no less important; the Bouexieres yielding 60 ounces of silver and 70 per cent. lead; the Plouvara, more recently discovered, ranging from 30 to 80 ounces silver and 40 to 70 per cent. lead; the La Ville Alhen, from 60 to 130 ounces silver and between 55 and 78 per cent. lead; the Rue Bourgee Mine, from 60 to 300 ounces silver and 50 per cent lead. At the La Ville Alhen mine operations were suspended during the revolution of 1790, after having been successfully carried on for about 25 years. Now that the French seem to bestow more energy than ever before on the development of domestic resources, and strikingly deficient as the country is in lead production, it is to be presumed that the resuscitation of this important industry will be taken in hand most vigorously, and that there will be no lack of capital to produce the desired results.

In Spain mining operations are in full blast in the rich province of Andalusia, and the output has been unusually ample since the commencement of the year. Prices have, in consequence, been gradually receding in the leading markets of Europe, and unless a decidedly favorable change takes place in the demand there for industrial purposes, which, at latest dates, remained slack, still lower figures may be reached on the other side.

In this country lead is in a much better position than it has been for a year past. During the summer of 1874 the government suddenly resolved to clear out its available supplies, at a time when we were yet suffering from the effects of the panic. The government surplus is now very nigh exhausted, and the sales of the Quartermasters' Department will no longer disturb the market. This year the spring business in lead has, it is true, also been a disappointment, causing prices to remain at a low range. But for the fall campaign a more flattering prospect opens, since it has been ascertained that the supply in the hands of both dealers and consumers has been allowed to run low. In order to at least partially meet these growing wants, a more extensive movement took place last week, and with it a more promising outlook seems to have been obtained. It will now remain to be seen to what extent the anticipated briskness in August will confirm the views entertained by these early purchasers, and on it will mainly depend the course of values until winter.

Car Building Practice.

In its external appearance the American passenger car gives very little indication of its structure, even to the most careful observer, unless he has some knowledge of the art of car building. Timber and framing are all carefully covered, and, with the exceptions of the truss plank inside and the truss rods beneath the body, there is nothing to indicate either weakness or strength. The chief strains to which a car body is subjected are those of "buffing," or blows in the direction of the length. These are so severe as to almost deserve to rank as collisions; yet they are unavoidable in modern railway practice. As these strains are not only the most severe, but the most frequent, and, at the same time, by far the most disastrous in their results, it is necessary that a well constructed car should have an abundance of strength to resist them. The resistance to buffing is furnished entirely by the floor framing. This framing consists of from six to eight timbers of hard or Southern pine, running from end to end of the car, and framed into two strong end-sills. These sills in ordinary work are from 8 inches upward in depth, and from 3½ to 6 inches wide—those outside being largest, the middle or center sills next, and the intermediate sills the smallest. The sizes vary considerably, according to the length and style of the car. The total area of the longitudinal timbers generally amounting to something more than 160 square inches. The end sills are very heavy hard pine timbers, as deep as the sills, firmly secured upon the ends of the longitudinal sills. Usually, when more than six sills are used, two are so placed as to form diagonal braces, giving the frame great power of resisting shocks or blows delivered upon the corners. The two center sills are placed quite near each other, and transmit from end to end any blow upon the end of the car. Near each end a heavy timber or iron truss, called a bolster, extends across beneath the floor frame, and is firmly secured to it. The under side of the floor frame is sheathed up, and upon the top are placed two layers of floor boards, usually at right angles. Some Master Car Builders add another floor, half way up between the timbers. These floors, solidly fastened to the timbers, give the whole mass of the framing great stiffness, while the whole is very light in proportion to its power of resistance. On the top of the side sills, and forming a base board in the finished car, is a heavy plank, usually about 12 inches deep and from 2½ to 3½ inches thick. This plank, set up on edge, is bolted down to the sill and secured to each post in the wall of the car by two heavy lag screws. These two planks, which commonly carry the inside ends of the seats in day cars, add very much to the strength and stiffness. In the wall of the car, below the window sills, a system of bracing similar to that employed in bridges, is used to aid in holding the body up. Beside this, there are from two to six truss rods used under the bottom of the car, to hold up the center of the body and prevent the ends from getting down. In the parts we have mentioned, we have the entire resisting power of a car. Its whole strength may be said to be below the window sill. Above this point the car is a mere protection from the weather and a shield to prevent injury in case the car turns over. From this it will be seen that the top of the car needs but little strength above that required for sustaining its own weight and maintaining its position. In our best cars the roof is treated as a simple covering, and carlins and ribs (timbers of the roof) are as light as can be safely used for driving nails into, while roof boards are but little heavier than is necessary to sustain a man walking over them. On some roads the roof boards are secured by screws, and the parts are made lighter in proportion. Between each pair of windows are two posts, rising from the sill and extending upward to the eaves of the car. These are almost universally of ash, preferably of the straightest and best that can be obtained. When examining a car in the frame, a person would be apt to exclaim against attempting to build it with such light timbers. It must be remembered, however, that after leaving the floor every ounce added to the weight of a car is so much taken from its strength, because above the floor nothing that we put in adds in any considerable degree to the stiffness or resisting power. In spite of these light timbers, our car when finished, can almost be compared to a well made cask, it is so strong and tough, and, aside from floor framing, so light. This object is obtained by the panels with which the body is covered. The panels themselves are whitewood boards from one-half to three quarters of an inch in thickness. In a few cases we have known even thinner panels to be used. The panels which are put on to the body with screws, are bedded in white lead so as to get a perfect bearing, and when the lead hardens it adds greatly to the stiffness of the structure. Another plan of putting on panels is to use glue and nails, in which case the inside of the panel is "canvassed," or covered with a sort of open mesh burlaps, or coarse canvass. This is cut out considerably larger than the panel, so that when in place the edge of the canvass turns up, and is glued to the posts and other parts of the framing against which the panel may come. It is put on after the panel is in place. When the glue is dry the whole inside work of the frame receives a good coat of paint. A panel put on in this fashion is exceedingly tough, so that it is almost impossible to break through it by any ordinary violence. A sledge hammer is almost powerless against even a three-eighth inch panel, unless in the hands of an experienced man. The hammer will rebound from the surface with great violence, and the panel does not yield until repeated blows have splintered the wood and entirelydestroyed the grain. This elasticity gives the body a power of resistance not to be obtained in any other way. The whole body becomes a unit, since the wood breaks before the canvass can be separated from the panels or posts. Inside, the panel work adds great stiffness when properly put up, as it is in large sections glued together and strongly secured to the posts, sometimes by glue, but commonly by screws.

The roof, in addition to its wooden frame, has usually several braces of wood and iron combined ("compound carlins," an iron carlin between two of wood), which run across from one wall to the other. At the ends these carlins are tied to the side sills by rods running down between the windows. Other tie rods cross the car, while joint bolts, bands at the corners, straps over weak places, and rods wherever they are needed, make the whole structure so strong that no ordinary amount of battering cannot injure it, beyond taking off the paint and ornamental battens. Even these, when put on, as is the practice now, are hardly ever injured. They are thin strips of iron used to cover the joints between the panels, and are secured fast. Such a car, thrown from the track at thirty miles an hour, may be dragged a long distance along the ballast, may roll down a bank, or, as has often happened within our knowledge, be tossed off the track, landing on its roof beyond the railway fence in a field, and yet sustain no serious damage. Here we may remark that generally when people in such a car have the presence of mind to grasp the front edge of the seat and hold themselves firmly in their places, there is little danger of their getting hurt.

In mounting the body of a car upon its trucks, one point is of great importance, and that is the check chains. These are chains, usually one at each corner, which, while they allow the truck to turn sufficiently to pass any ordinary curves, will not allow it to turn at any considerable angle with the body. In a run off, the check chains, when properly secured, keep the trucks in line, and the car will not readily get across the track, nor will there be much danger of a wreck, because the train can generally be stopped in time to save it.

In comparing a car constructed on this system with a car of the kind commonly employed on English and Continental roads, it is obvious that the former has vastly the advantage in the matter of strength. When an American passenger car jumps the track, is tossed about and stood on its head—so to speak—the only injury to passengers, under ordinary circumstances, results from their being rolled about inside—stood on their heads, in fact. When a similar accident happens on an English road, panels, doors, running gear, sole plates, horn plates, roofs, broken glass and passengers are usually ground up together, and suffer about equal damage. On the 12th of last month the New York and Boston express train was thrown from the track by running over a horse at a crossing. Two sleeping cars were thrown from the track, and the first fell in a position at right angles to the rails. The other one turned over on its side tearing away a depot platform. The shock was terrific, but the damage done to the cars can be estimated from the fact that it was necessary to *break the windows with handspikes* in order to get the passengers out, none of whom were killed or very seriously hurt. An English car under such circumstances would have been broken into countless fragments, and those among the passengers who escaped alive would prob-

aby have been killed with excitement. As examples we refer to the Wigan and Shipton accidents.

Service Pipes.

The question of best material for service pipes is one of the most important that is met with in discussing the methods of plumbing; and it is becoming of greater and greater importance as the introduction of water works goes on. Almost every town in the country of any considerable size, has its water works, and, of necessity, the greater portion of dwellings and stores in them receive their supplies of water from the street mains. If health was in no way concerned, the matter would be a very simple one, for the lead pipe, taken all in all, would probably be the one universally preferred. Lead, from the facility with which it is bent and worked into shape, when cold, has been in all ages the favorite metal with plumbers. In fact, the name of the trade is derived from the Latin name for the metal, *plumbium*, and the plumbers were really lead workers.

With the exception of ease of working, however, lead would hardly have sufficient advantages to make one choose it as a material for a service pipe. Lead pipe is, under many circumstances, durable, easily handled and reasonably cheap; but it is weak and heavy, and is attacked by certain kinds of water, so that the pipe is quickly destroyed and the water flowing through it is poisoned. In other kinds of water it is harmless, exhibits a wonderful durability, and, except for its weakness, would be a very perfect pipe. But its very ductility is sometimes against it, because in long lines of straight pipe the metal is constantly stretched by the cold, and in warm weather the heat expands the metal and lays it up into waves or folds, as the case may be.

In the attempt to find something better than lead as a material for service pipes, block tin has been largely used, but with only moderate success. We use the term service pipe for convenience, to cover the whole service system for the distribution of water in a house. The tin melting at a comparatively low temperature (421° Fahr.) makes its use somewhat more difficult. It is harder than lead, yet, being less ductile, it does not work as well, and a job is not as easily executed with it as with lead. In some kinds of water the tin is rapidly corroded. Instances have come under our notice in which a pipe has been rendered useless in the course of a few years by having holes eaten through it. This was the ordinary block tin of commerce. Fortunately, the salts produced by the action of the water upon tin are not poisonous, and though the pipe may be destroyed, the health of those using the water is not thereby endangered. Tin, however, as a material by itself for service pipes, is hardly to be recommended, for, though it is safe, there are too many mechanical objections to it to make it a favorite with either plumbers or builders.

Tin-lined lead pipe has, within a few years, been very extensively used, and in many instances given great satisfaction. As now made, the interior coating is perfect, and if the joints are made as they should be, there is not the least trouble in regard to them. If, however, this pipe is worked in the same manner as lead, serious difficulties will be found. When well put up, there is little trouble. The lining is liable to be corroded by waters that attack block tin pipes. There is no trouble in making good joints by means of the tinned brass ferrule supplied by the manufacturers, but plumbers will not use them, preferring the solder joint, upon which they can overcharge without exciting suspicion. As the consequence, joints in tin-lined lead pipe are not, as the rule, well made.

Iron has been employed for service pipes in houses, with a good degree of success, but the danger of iron rust upon washed white fabrics, and the rapid decay of the pipe, makes it undesirable. The water coming through iron is not considered in any way injurious, even when a perceptible amount of the metal is present. The low price of drawn iron tubes, their great strength, and the ease with which they are put up, make them very desirable, provided they can be rendered durable by protection from rust. Galvanized iron pipes have been in the market many years, and of their utterly bad character for service pipes we have frequently spoken at length. In many cases the iron, imperfectly covered by zinc, is more rapidly eaten away than it would be if left entirely unprotected. In a great variety of waters used for the supply of towns, zinc is rapidly corroded, and the resulting zinc salts are highly poisonous. Many efforts have been directed toward tinning iron pipes, but serious obstacles in the way have prevented any successful application of tinning. The outside of the pipe could be very nicely coated, when desired, but on the inside exposed portions were sure to be left, or, the coating would be so thin as to allow the water to penetrate to the iron, and begin the work of corrosion when the thin film of tin would be displaced, and the iron beneath exposed. In this case the objection was a commercial one. The pipe was too rapidly destroyed to be used economically. Much has recently been said in regard to glass lined iron pipe, and, at first sight, the glass lining seems to be a very good thing, but there are several serious objections to its use. The glass is brittle, and in screwing the lengths home the twist of the pipe is likely to break the glass. Plumbers urge the difficulty and danger of handling iron pipe containing a brittle glass lining. They also state that the pipe cannot be conveniently cut to length, and hence is unsuitable for their work. There are certainly a great many chances against a common workman making a perfect job with a material of this character. We do not know how the glass would stand hot water, but we fear that it would soon be destroyed by unequal expansion. Theoretically, glass lined pipe is very good, but practically it is, we fear, utterly impracticable. Tar has been very successfully used for lining large cast iron pipes, and has been proposed for service pipes, but does not seem to have worked well in them.

The most promising thing that has come under our notice is the protection of an iron pipe by the insertion of a thin tin pipe inside of it. The tin pipe is drawn very thin, and of such a size that it can be pushed inside of the iron pipe. Hydraulic pressure is then applied to the inside of the tin pipe, which is expanded so as to firmly fit the inside of the iron pipe. The tin has a sufficient thickness to make the lining perfect. In cutting the pipe a drop of solder is run around the end to cover the iron. Tin and brass ferules are also made to go in the joints, so that when the end of a pipe is screwed into a coupling the iron is completely protected by the tin. The quarter turns and couplings are of iron tinned in the ordinary manner, and being of small size, there will be no difficulty in giving them a perfect coating. In protecting the end of a pipe that is to go into a coupling or quarter-turn, there are a variety of ways to be employed. We have cut pipe and left enough of the tin projecting to turn smoothly over the end of the pipe and cover it completely, which is better than the solder. In cutting the pipes it is best to use a special tool, and take a little care, but the time needed is no greater, if as great, as with the commoner tool. It has not yet been in service a sufficient time to enable us to give an opinion in regard to it, the first lot having been put up but two years since. It has stood this service well, and seems in good condition now. For convenience of putting up and in first cost there seems little to be desired. The matter is one of great interest and importance to our readers, and we shall watch its progress very carefully. From what we have seen and learned of it, we think it may be pronounced an important step in the direction of progress, giving us what we have never had before, a theoretically and practically perfect service pipe at a moderate price.

A respected correspondent writes to us as follows: "Can you not, in your paper, "impress the pig iron makers with the "necessity of blowing out their furnaces, "as the only remedy for an over produc-"tion." We are always glad to present such facts to our readers as will aid them in forming correct opinions as to the future of the iron market and the policy most profitable for them to follow. We cannot, however, undertake to impress them with the necessity for anything, except caution, good judgment and close economy. It may be assumed that the owner of a furnace knows better than any one else whether it is best for him to continue it in operation or to blow out. If he does not, it is not probable he would take any advice or be influenced by any arguments. The Iron and Steel Association made an effort last year to decrease production by an agreement among furnace owners, but it was found impossible to induce any considerable proportion of them to sign an agreement, and the attempt was abandoned. We do not wish to repeat the unsuccessful experiment; furthermore, we do not believe it is our duty at this time to advise the blowing out of any stacks which the owners can afford to keep at work. The effort to avoid loss will prove a constant incentive to close and intelligent economy, and under such conditions as those now affecting the trade, furnace managers will learn more about making cheap iron in six months than they would be likely to learn in six years of great and uninterrupted prosperity. We believe that many and important contributions are now making to the metallurgy of iron, and that when prosperity returns, bringing an increased consumptive demand for pig, we shall be in a better position to take advantage of it than ever before. There is no reason why iron should not be made in this country at an average cost below the average selling price of the past twenty years, and the experiences through which we are now passing are well calculated to teach us how to make iron cheaply and at the same time profitably.

Coal and Iron in the United States.

Notes of a Visit to Coal and Iron Mines and Iron Works in the United States.*

BY MR. I. L. BELL, F.R.S.

(Concluded.)

It is not needful to describe, at any great length, the line of conduct pursued by the proprietors of iron ore mines. In principle it was the same as that of the coal owners, but, in some instances, it was of aggravated intensity. In these, the means of supply were in very few hands, and, in one case, those who controlled it have preferred seeing furnace after furnace extinguished rather than bring the resources of their property to market at a reduced price.

To show the combined effect of the influence as just related on the cost of production, I will give the expense of making a ton of pig iron at three different periods, obtained from a source I regard as entirely trustworthy. The first series of figures is for 1860, when the iron market was very quiet; the second is for 1871, the year preceding the period of great excitement; and the third is what it rose to in 1873, when extravagant profits were realized, and at which it is, unfortunately for the furnace owner, continuing at, long after profits of any kind can be counted upon:

	1860. £ s. d.	1871. £ s. d.	1873. £ s. d.
Coal, ore and limestone	1 15 9½	2 19 8	3 17 7
Labor	0 6 6	0 9 9½	0 10 4
Stores and other expenses	0 5 6	0 8 6½	0 10 8
	£2 7 9½	£3 18 0	£4 18 7

I may add that these figures are entirely confirmed by the information I received all through the Northern States, viz., that within a dozen years, the cost of pig iron had doubled, and further, that it could not be sold at the present time without entailing a loss to the producer.

From the maker of an article entering so largely into human requirements as iron, I was anxious to turn to hear how the consumer regarded the network which had been woven about him and which appeared to me, of necessity, to cripple his action. I accordingly addressed myself to the largest consumers—viz., the directors of railways and locomotive engine builders, believing that they could have no wish to have the cost of their rails or boiler plates increased by the payment of a tax to the State.

In this expectation I was disappointed, both declaring that, in their opinion, high wages enabled the working classes to move more freely about, and thus added to the general prosperity of railway companies and engineers. Now, undoubtedly, so far as cutting coal and puddling iron are concerned, the system pursued has been singularly successful, the operatives in both these branches having been able to earn from 20/ to 30/ per day during the year 1873. But it cannot be pretended that every branch of labor has to be similarly paid. The railway director cannot desire to excavate his line, cut his sleepers, man his stations, and run his trains with wages based upon such a scale of pay.

Another advantage these protective duties were alleged as possessing was the contribution they afford to the revenue of the State; in other words, in the case of iron, that they who use most of this metal pay more than their share of the national expenses. This argument, however, is perhaps the weakest of all when it comes from the mouth of an iron master, because his object in asking for a high tariff is not to pour money into the national treasury, but to curtail this to its smallest amount by reducing the quantity of iron upon which the duties are levied to its lowest possible figure; in short, the iron manufacturer seeks to avoid foreign competition by excluding its importation entirely.

Leaving, however, the question as to whether an industry, having to contend with disadvantages peculiar to itself, is entitled to receive from the State any protection of the description just mentioned, let us briefly consider whether, in the case of the United States, this protection is in reality required in the manufacture of iron.

The supposed disadvantages in the case of the United States may be considered as arising either from dear labor or physical impediments connected with procuring or bringing together the raw materials, added to difficulties in sending the produce to market.

In *The Iron Age* of 22d October of last year, an ably conducted journal, dealing especially, as its name would indicate, with the metallurgy of iron, is an article entitled "Why England Suffers from Foreign Competition."

The chief reason why we suffer, according to this authority, is, that we are no longer able to command what the writer designates as "pauper labor," and this so-called pauper labor has caused British manufacturers to neglect keeping pace with the progress of the times, which neglect has led to our overlooking to afford any "encouragement to inventive talent to devise labor saving machinery."

If this language is intended for the British manufacturers of iron, its author must be but imperfectly acquainted with the real circumstances of the case, for, in his comparison, he draws a distinction between the Continent of Europe and our own island. When I say that the rates of wages are at the present moment, and in last October were, and always have been, much higher with us than in any iron making center on the Continent, I am merely stating a fact which has been remarked and commented on by every writer on the subject for the last 25 years. To the statement that "labor saving machinery" has been neglected, I have only to observe that the extent to which, in spite of higher wages, we reduce our expenses of manufacturing to the level of the cost of our neighbors, has been the subject of admiration to every Continental iron master who has visited our furnaces and mills. Indeed, and this, perhaps, will carry more weight with *The Iron Age* than French or German approbation, some of my American friends have considered it expedient to introduce in the most recently erected blast furnaces some admirable lessons they generously admitted they had learnt in England.

It is, however, a fact, and anti-free trade apostles would do well to remember it, that our commercial policy has had an effect upon the state of affairs with our immediate neighbors. Our large importations of food have conduced to a rise in its value abroad, and, as a result, wages there, from this as well as other causes, have, during recent years, been gradually advancing. In like manner, the great inducements which the American iron masters held out to emigration from this country have produced a sensible effect upon the cost of labor with us. Pig iron, at ten pounds a ton, no doubt affords an immense margin in this respect, but as soon as commerce is made fully sensible of this heavy load, the demand falls off, and the current of emigration is arrested—indeed, it may be said, is reversed, for a certain number of workingmen are returning from America to their native country.

Of course, it is possible, as it is proper, that the United States should enter into the market and bid against ourselves for labor; that they will do, without any regard for our "sufferings from foreign competition;" but that they should do this, and then require that their own people should submit to a heavy tax, in order that they might pay extravagant rates of wages, will be regarded by us, as it is by very many among themselves, as a piece of very questionable policy.

Admitting for a moment the expediency of encouraging the introduction of a new manufacture, or even of discouraging external competition by the levying of import duties, so as to place both on a position of equality, is the iron trade of the United States entitled to such a position? The mineral resources of that country are of unquestionable extent, but so are our own, and they will remain so for centuries to come. With labor on anything like equal terms, it is a physical impossibility that iron can be made more cheaply in the United States than it can in England. For this labor the iron makers there can and will bid with ourselves, but they may pursue this course to their own disadvantage. I would ask those who are disposed to deny the justice of this statement, to reconcile the position of the iron master there of a dozen years ago, who carried on, at all events, a moderately successful trade, with pigs at not much above half the price of the present day. Since that time the science of iron making has made considerable progress, and, notwithstanding, the cost of production has more than doubled, owing either to the immense increase in the price of labor, or to these artificial barriers to commercial progress to which allusion has already been made.

If my information as to former cost be correct, then I say that it is one against which no British maker at that time could compete, looking at the charge for freight he would have to meet before he laid down his ton of iron alongside that manufactured by the American iron master.

If the truth of these statements is conceded, the Lehigh furnace owners ought to be able, with their natural facilities, and with labor at some increase on its former cost, to meet us in New York upon more than equal terms, while those of the Cleveland, Pittsburgh, Hanging Rock, and other Western regions, can hold their ground successfully against us, by virtue of the land carriage which, in addition to that by sea, we must incur before we can deliver our iron at their doors.

So far I am taking no account of the comparatively undeveloped resources of Tennessee, Georgia and Alabama, which will, as I have already indicated, prove a match for any part of the world in the production of cheap iron, and this brings me to considering upon what principle a protective duty on the importation of iron into America has to be levied. Has it to be in amount sufficient to protect the puddler, who received, in 1860, 12/3 per ton for his work, or must it be raised so that he may continue in the receipt of nearly three times this price; or has it to be regulated by the inability of the furnace owner to meet competition with pig iron under £5 a ton, although he himself, a dozen years ago, could make it for 50/, there being nothing in the powers of supply of coal or ore to account for the change? We are not, indeed, compelled, for the purposes of this argument, to compare the present with former times, for there seems every reason for believing that pig iron can now be laid down in the Southern States mentioned above at little above one-half the cost of that made in the North. Has the consumer in Alabama or Tennessee to pay for his metal, made at 50/, £5 or £6 a ton, because the smelter elsewhere, owing, as I think, to artificial reasons, cannot afford to sell it without loss at a lower price.

Notwithstanding, however, the protestations in favor of the system of protective duty, there seems to dwell in the minds of its adherents a suspicion that the reverse may, after all, be more sound in principle. Whether I am correct in this supposition or not, our friends of the Western Hemisphere, if not admirers of our commercial freedom, are not unwilling to avail themselves of its advantages.

Annually the American Iron and Steel Association sends out a report, giving ample and very valuable information connected with the position of affairs affecting these trades. That for last year has just been issued, and it contains abundant proof of the ability and assiduity of the courteous secretary of that body, and marked by both these attributes is his advocacy of protection to the native industry of his own land. I gather, however, from his remarks, that our native industry may safely be left to take care of itself.

As we all know, there are several works in the West Riding of York employed chiefly in the manufacture of the finer kinds of wrought iron, particularly that used for railway carriage wheels. In America the material used for this purpose is cold blast charcoal pig iron, and a document, quoted by the American Iron Masters' secretary, congratulates the trade on the fact of 100 tons of this pig iron having been sent here in the hope of displacing the native make of our Yorkshire friends. Nay, so intent is the authority quoted in the "Report" to undertake every office connected with the introduction of "car wheel iron" into England, that he appears not to be willing to rest satisfied until the whole of these requirements of this commodity is conveyed to our shores in American vessels.

We will promise no impediment to the realization of these wishes. We use American oak, though we have heard of British, in constructing our railway carriages, because it suits our convenience. For the same reason, these carriages may run on wheels of American car wheel iron, if it is better than Yorkshire brands, and we have no intention of refusing either oak or iron, even if they are brought to us in vessels carrying the American flag.

Among the best signs of a nation's power and proficiency in manufacturing science and skill, is the position it is able to assume in exchanging those commodities, natural and otherwise, which circumstances have placed within its reach, for those in the production of which other countries possess superior advantages. It is, therefore, with very justifiable pleasure that the Secretary of the American Association calls attention to the increase of exports as exhibited by the custom house returns of the United States, and particularly by those in which iron and steel enter largely.

This gentleman, however, is too cute not to see that after asserting that the American iron-masters require for their very existence a high protective duty to be levied on British iron, there is a little inconsistency in their being able to export locomotive engines in competition with British manufacturers, and this inconsistency is rendered the more conspicuous when we are told that these very locomotives pass our shores on their way to St. Petersburg, the place of their destination. And how is this apparently unsurmountable difficulty accounted for? The high tariff of the United States gets the credit for it. High prices enable the American ironmasters and machine makers to pay high wages, which has so fostered the inventive genius of our relations across the water, that the economy with which they can construct machinery, and its excellence when constructed, render them able successfully to compete with the old country.

No one can deny the existence of great ingenuity on the part of the American mechanicians, and I deemed it simple justice to place their achievements as a worthy continuation of what had been effected in this country by their ancestors, and pursued since by their cousins.

Admitting, however, the truth of the language of the report, let us see where it lands us. A locomotive manufacturer, say in Philadelphia, receives into his establishment dearer iron and dearer steel than does a house, say, in Newcastle-on-Tyne. By dearer labor, but with greater skill, out of these he builds his engine, pays a higher freight, and undersells our Stephenson's and our Hawthorn's, in St. Petersburg.

I have described to you beds of coal and mountains of ore, as they exist in America, which the world itself may be challenged to beat. Are the iron consumers of that great country, not we, entitled to ask that a portion of that ingenuity which enables one of their locomotive engine builders, under considerable disadvantages, to compete with us, should be applied to the manufacture of iron? which manufacture commences under natural conditions, to say the least of them, equal to those possessed by ourselves.

We are further informed by the document I am considering, that no humane and patriotic American wishes his men to work for low wages. I cannot say that I gained, during my visit, any clear idea of what is meant in the abstract by low wages, but I can safely assert that in discussing the labor question in America, I could not detect any difference between the sentiments expressed by the ironmasters on the two sides of the Atlantic. That there is a limit even to the liberality of our American colleagues, I presume will not be denied, otherwise, how can we account for a nine months' strike among the puddlers at Pittsburgh, when it was proposed to reduce the price from 34/ to 30/ per ton, or for the presence of an armed force among the anthracite pits at Hazelton, to keep the miners quiet, who, in the matter of a proposed reduction of wages, do not seem to agree with what is just, not to say liberal, on the part of their employers.

The report condemns, to some extent, the adoption of improvements rendered necessary by the progress of the day. "As well ask," it continues, "the owner of a square piano to destroy it, because it is not a grand piano." Perhaps, so long as the musician plays for his own amusement, no one would find fault with his holding by his old fashioned instruments, but to compel an audience to pay and listen to inferior music, when better was to be had, would be an argument addressed to unwilling ears.

After all, however, the current which will compel the remodelling of iron works needs no foreign country to set it in motion in the United States. The enlarged furnaces erected in its different localities, and the admirable improvements effected by Holley and Fritz in rolling mills and Bessemer plant, will have their effect on those to whom circumstances render advance a matter of difficulty. It may be that "the policy which crushes the weak and exalts the strong" is not desired by the former, but it is an inevitable one in the history of industry.

In a political point of view no argument can be, as I believe none will be, advanced by the North against the development of the iron resources of the Southern States, and yet it is by no means impossible that some less favorably situated works in the former may suffer more by the competition which, before long, may spring up nearer home, than from any that we, in this country, are able to offer.

It is not, however, needed that we should seek, on our side of the Atlantic, for what to me seems sounder doctrine than that propounded by the Secretary of the American Iron and Steel Association, for these are the words of the president himself of that body in his last annual address, delivered on 11th of February of this year:

"Now is the opportunity to prepare for new efforts. Old processes must yield to better ones. Old machinery must be pulled down and better devices substituted. Intelligent economy must now be the order of the day, and our old method of puddling and rolling and heating must undergo a thorough examination and revision. If the Danks' furnace has not come up to what it promised, our inventive powers must be called into action to supply its defects or supplement it with something better. The Siemens and Ponsard heating furnaces, wherever used, have given better and more economical results than the old style of furnaces, &c."

The president then goes on to speak in commendation of breaking "down the barriers which have hitherto existed between the iron masters of the two countries of Great Britain and America," by which "each will learn to respect and emulate the other, and no doubt the advantage will be mutual."

The first of these sentiments will, I am sure, meet with a ready and warm response in the breast of every member of the Iron and Steel Institute of this empire, and I would offer my judgment, for as much as it may be worth, in assuring you of the entire truth of the second aspiration of my friend Mr. Reeves.

Plating with Aluminum.—According to John A. Jeancon, of Newport, Ky., metal surfaces may be plated with aluminum by the following process with great facility: Dissolve any desired quantity of a salt of aluminum, such as sulphate, muriate, nitrate, acetate, cyanide, etc., in distilled water, and concentrate the solution to 20° Beaume (at 50° Fahrenheit), in a suitable vessel to hold the article to be plated. The battery to be used should either be four pairs of Smee's zinco-platinum, of three of Bunsen's zinco-carbon, with the elements connected for intensity, and a plate of aluminum attached to the negative wire. The solution should be slightly acidulated with its appropriate acid, heated to 140° Fahrenheit, and kept at that temperature during the operation.

One of the great railroad companies of England purposes buying the Blaenavon Iron Works for the purpose of manufacturing rails and other iron.

A telegram has been sent from this city to London, and an answer received in 30 minutes actual time. Each message traveled 3600 miles, and passed through the hands of 18 persons.

---

* Paper read before the Iron and Steel Institute.

The Iron Age.

New York, Thursday, July 1, 1875.

DAVID WILLIAMS - *Publisher and Proprietor.*
JAMES C. BAYLES - *Editor.*
JOHN S. KING - - *Business Manager.*

NEW YORK, January 2, 1875.

Until the 1st instant the postage on newspapers was paid by subscribers at the office where the paper was received, the yearly rates on the different editions of *The Iron Age* being as follows: Weekly, 40 cents; Semi-Monthly, 40 cents; Monthly, 24 cents.

Under the provisions of the new postal law, which went into effect on the 1st instant, prepayment at the office of mailing is required, at the rate of two cents per pound for the Weekly, and three cents per pound for the Semi-Monthly and Monthly, which will make the postage as follows on the different editions: Weekly, 50 cents; Semi-Monthly, 30 cents; Monthly, 15 cents.

Our rates of subscription will therefore be as follows:

Weekly Edition.....$4·50 a year.
Issued every THURSDAY Morning. Contains full Trade Reports for the week, brought up to the close of business on the previous day.

Semi-Monthly Edition.....$2·30 a year.
Issued the FIRST AND THIRD THURSDAY of every month. Contains a full Review of the Trade for the previous half month.

Monthly Edition.....$1·15 a year.
Issued the FIRST THURSDAY of every month. Contains a full Review of the Trade for the previous month.

To Foreign Countries.
Including Postage.

To	Weekly.	Semi-Monthly.	Monthly.
Canada	$4 50	$2 30	$1 15
Cuba	5 04	2 52	1 26
Great Britain	6 08	3 04	1 52
France	7 12	3 56	1 78
Germany	6 08	3 04	1 52
Prussia	6 08	3 04	1 52
Buenos Ayres	8 16	4 08	2 04
Peru	6 08	3 04	1 52
Belgium	6 08	3 01	1 52
Mexico	8 68	4 34	2 17
Sweden	6 08	3 04	1 52
New Zealand	8 16	4 08	2 04
Brazil	8 68	4 34	2 17

ADVERTISING.

One square (12 lines, one inch), one insertion, $2 50; one month, $7·50; three months, $15·00; six months $25·00; one year, $40·00; payable in advance.

All communications should be addressed to
DAVID WILLIAMS, Publisher,
10 Warren Street, New York.

EUROPEAN AGENCY.

CHARLES CHURCHILL & Co., American Merchants, 28 Wilson Street, Finsbury, London, England, will receive subscriptions (all postage prepaid by us) at the following prices in sterling: Great Britain and France, 25/; Germany, Prussia and Belgium, 33/4; Sweden, 50/. They will also accept orders for advertisements, for which they will give prices on application.

City Subscribers will confer a favor upon the Publisher, by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age*: also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in hall ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

CONTENTS.

First Page.—Improvement in Screw Cutting Machinery. The Government Tests of Iron and Steel. Working Heavy Grades in Switzerland. California Borax. The Brown Iron Company's Works. A Dead Blast Furnace.

Third Page.—Sound Castings.

Fifth Page.—New Chimney Cowl. Saving Life at Sea. Compression in Casting. Lead. Roman Kitchen Utensils.

Seventh Page.—Cheaper Stock for Pennsylvania Furnaces. The Jackson Iron Company. New Electric Clock. The Copper Cent. Rapid Process for the Detection of Lead in the Tin Lining of Vessels.

Ninth Page.—Business Items.

Eleventh Page.—Philadelphia Correspondence. Metallurgy in Japan.

Fourteenth Page.—American Iron for Export. The Lead Markets. Car Building Practice.

Fifteenth Page.—Service Pipes. Coal and Iron in the United States. Plating with Aluminum.

Nineteenth Page.—Influence of Mining Industries on Civilization. Extraordinary Specimen of American Sheet Iron.

Twentieth Page.—The Watson Bridge Works Burned. Iron Manufacture in California.

Twenty-first Page.—Trade Report.

Twenty-Second Page.—Trade Report.—(continued).

Twenty-third Page.—Our English Letter. Paints for Engineering Structures. Manufacturing Charcoal.

Twenty-fourth Page.—Manufacturing Charcoal—(continued). Roman Aqueducts and Baths.

Twenty-seventh Page.—The Iron Age Directory.

Twenty-eighth Page.—Petroleum in Iron Manufacture.

Thirtieth Page.—New York Wholesale Prices of Hardware and Metals.

Thirty-first Page.—New York Wholesale Prices (concluded).

Thirty-fifth Page.—Philadelphia, Buffalo, Cincinnati, Pittsburgh and Detroit Hardware and Metal Prices.

Thirty-seventh Page.—Chicago, Boston, and St. Louis Hardware and Metal Prices.

American Iron for Export.

"Merchants are selling American Iron "at Wolverhampton at $35 per ton." So says an Associated Press dispatch under date of June 24th. The item will probably surprise a great many of our readers, especially those who have doubted the practicability of exporting pig iron from this country to foreign markets. Of course, all interested are aware that the American iron which merchants are selling at Wolverhampton is charcoal pig iron, and that the price named leaves a fair but small margin of profit. Nevertheless, such a telegram at any time within the past three years previous to 1875 would have excited in the minds of the public a degree of astonishment which will not now be the case, because of the general knowledge of the people that our imports from Great Britain of raw irons have almost ceased, and that we can supply certain grades of the same material to that country on better terms than can be obtained elsewhere. The inception of our iron shipments to England has been the source of so much discussion as to need no repetition here. Like all new ventures on a foreign market, our charcoal iron shipments were regarded with distrust and doubt as to the quality of the metal, and the usual uncertainty arising from disbelief that the United States could possibly furnish a quantity of charcoal iron capable of competing with Swedish irons in purity. The facts are, that until very recently, notably until after the establishment of the British Iron and Steel Institute, the English iron master was in profound ignorance not only of the American iron trade, but particularly of the production of charcoal irons with us, and the quality of the metal made. The history of the reception of the first shipments made this season, as given us from private letters from parties conversant with the matter, is as follows: The first lots were disposed of with difficulty, as was perfectly natural, in ten ton samples as "flyers," to use brokers' parlance. The first, or nearly so, if we remember aright, went to an agricultural machine works for admixture. This order was supplemented by others for more of the same iron, and the Liverpool brokers and iron merchants were besieged with correspondence as to quality, price, etc., of the new iron. Subsequent shipments resulted in a better reception, and the uses of American iron possessing good chilling properties was to a certain extent adopted for certain castings, while some of it found its way to the crucible steel works. So far as we are informed no attempt has yet been made in any instance to adopt our iron for car wheels, nor, despite the recommendation of numerous influential journals, is there any progress toward the introduction of the American form of chilled iron car wheel. Should, indeed, such occur, it is more than probable that the experience of the American wheel founders will be taken advantage of, and the finished product imported from the United States at better prices than the wheels could be made in England from American pig. Hence we may not look for any immediate market for charcoal irons in England for wheel purposes. The question of profit, however, has been tolerably well settled in that equally as good prices are obtainable in Great Britain for our Southern charcoal irons as in the home markets, and the probability of a fairly active demand steadily increasing as the merits of the metal become known. Such is the condition of the present charcoal iron trade with England. In various articles, published from time to time previously, we endeavored to contribute to this precise result, and in so doing accomplished what has not hitherto been done, viz., to obtain reliable information as to actual costs of production in the South and Southwest. From the very interesting, graphic and statistical correspondence furnished us on "Charcoal Iron Making in the South," which have been running through our columns for a series of weeks, it appears clearly that charcoal and coke irons are made in that section of the country which, providing the ores are of sufficient purity to insure good quality, can be shipped abroad at a profit unless some extreme advance of freights should take place. The latter is unlikely to affect Southern ports, however, as pig metal can always be supplied under cotton cargoes at low rates. The policy of extending this trade is clearly manifest, as it gives an outlet to a large proportion of our product which would at present otherwise be uncalled for, and also furnishes a substitute for grain exports, which would produce smaller returns or never be made at all.

Whether our export trade will be limited to charcoal irons, or whether we can expect to build up a trade in other grades of pig metal after the wedge is once entered and a trade fairly established with foreign markets, we cannot now predict. We can no doubt make iron which could be used with advantage and profit in European foundries and mills, but whether we can export them or not depends upon the cost of making them in this country. That the present is an inauspicious time to attempt any such exportation is clearly evident, but with any improvement in the English iron market it is quite within the range of possibilities. Against ordinary pig irons the only possibility of competition would be in strength, and in this American irons are far ahead of English, so far, indeed, as not to be considered in the same category. American pig iron has stood a test of 20,600 lbs. to the square inch, as in the case of anthracite iron made by the Powhatan Iron Company, of Richmond, Virginia, while from 1600 to 2000 lbs. less may be considered an average of first-class coke or anthracite irons, charcoal ruling higher. We have not at hand tests of English iron, but from specimens of ship plates left here from repairs to Clyde built ships it is quite evident that the pig from which this had been made could never have approached in strength the figures given. If we can make our irons cheap enough we shall undoubtedly be able to sell them for special uses in foreign markets: if we cannot, it is idle to hope of exporting them, however good they may be.

The Lead Markets.

About six weeks ago the European lead markets, under the stimulus of a demand incident to the menace of war, experienced a sudden upward movement, while this market remained dull and stagnant, with little prospect of a speedy improvement.

Since then the relative position of the markets of both continents has undergone a radical change. In Europe, since the apprehensions of political complications have been allayed, the price has been steadily tending downward, while here more extensive purchases for *bona fide* consumption have followed closely upon a slack spring demand preparatory to an active fall trade. It will be remembered from former statistics of ours that the world's normal lead production sums up something like 300,000 tons, toward which England contributes 70,000; Spain, 67,000; Germany, 49,000; the United States, 46,500; Italy, 23,000; France, 17,000 (mostly from Spanish ores); while the remaining countries furnish 27,500. Thus, of the larger producers France turned out the least, and even this little was in the main derived from the neighboring Peninsula. Yet France has at all times been one of the largest consumers, and its dependence on other countries for a supply has been anything but a comfortable fact in the appreciation of the French people. The subject has engaged the attention of Frenchmen, and some long abandoned lead mines of Brittany of unusual richness are now to be made to yield some good returns. Mining operations near St. Brieuc were commenced by the ancients, who carried on their works on an extensive scale, though, of course, in a very imperfect manner. The works were partially resumed about eight or ten years since, when a steam engine was erected, the shafts and levels cleared and repaired, and about 60 tons of ore sold, some of which realized at Swansea over £37 per ton. The proprietors, however, became involved in the panic of 1866, the works were abandoned on the eve of success, and the mine allowed to fill with water. Some two years ago another attempt to re-open the mine was made, and some 60 tons of ore were raised and sold, which satisfied those concerned that the property was worth energetic development.

Other mines in the same locality seem no less important; the Bouexieres yielding 60 ounces of silver and 70 per cent. lead; the Plouvara, more recently discovered, ranging from 30 to 80 ounces silver and 40 to 70 per cent. lead; the La Ville Alhen, from 60 to 130 ounces silver and between 55 and 78 per cent. lead; the Rue Bourgee Mine, from 60 to 300 ounces silver and 50 per cent lead. At the La Ville Alhen mine operations were suspended during the revolution of 1790, after having been successfully carried on for about 25 years. Now that the French seem to bestow more energy than ever before on the development of domestic resources, and strikingly deficient as the country is in lead production, it is to be presumed that the resuscitation of this important industry will be taken in hand most vigorously, and that there will be no lack of capital to produce the desired results.

In Spain mining operations are in full blast in the rich province of Andalusia, and the output has been unusually ample since the commencement of the year. Prices have, in consequence, been gradually receding in the leading markets of Europe, and unless a decidedly favorable change takes place in the demand there for industrial purposes, which, at latest dates, remained slack, still lower figures may be reached on the other side.

In this country lead is in a much better position than it has been for a year past. During the summer of 1874 the government suddenly resolved to clear out its available supplies, at a time when we were yet suffering from the effects of the panic. The government surplus is now very nigh exhausted, and the sales of the Quartermasters' Department will no longer disturb the market. This year the spring business in lead has, it is true, also been a disappointment, causing prices to remain at a low range. But for the fall campaign a more flattering prospect opens, since it has been ascertained that the supply in the hands of both dealers and consumers has been allowed to run low. In order to at least partially meet these growing wants, a more extensive movement took place last week, and with it a more promising outlook seems to have been obtained. It will now remain to be seen to what extent the anticipated briskness in August will confirm the views entertained by these early purchasers, and on it will mainly depend the course of values until winter.

Car Building Practice.

In its external appearance the American passenger car gives very little indication of its structure, even to the most careful observer, unless he has some knowledge of the art of car building. Timber and framing are all carefully covered, and, with the exceptions of the truss plank inside and the truss rods beneath the body, there is nothing to indicate either weakness or strength. The chief strains to which a car body is subjected are those of "buffing," or blows in the direction of the length. These are so severe as to almost deserve to rank as collisions; yet they are unavoidable in modern railway practice. As these strains are not only the most severe, but the most frequent, and, at the same time, by far the most disastrous in their results, it is necessary that a well constructed car should have an abundance of strength to resist them. The resistance to buffing is furnished entirely by the floor framing. This framing consists of from six to eight timbers of hard or Southern pine, running from end to end of the car, and framed into two strong end-sills. These sills in ordinary work are from 8 inches upward in depth, and from 3½ to 6 inches wide—those outside being largest, the middle or center sills next, and the intermediate sills the smallest. The sizes vary considerably, according to the length and style of the car. The total area of the longitudinal timbers generally amounting to something more than 160 square inches. The end sills are very heavy hard pine timbers, as deep as the sills, firmly secured upon the ends of the longitudinal sills. Usually, when more than six sills are used, two are so placed as to form diagonal braces, giving the frame great power of resisting shocks or blows delivered upon the corners. The two center sills are placed quite near each other, and transmit from end to end any blow upon the end of the car. Near each end a heavy timber or iron truss, called a bolster, extends across beneath the floor frame, and is firmly secured to it. The under side of the floor frame is sheathed up, and upon the top are placed two layers of floor boards, usually at right angles. Some Master Car Builders add another floor, half way up between the timbers. These floors, solidly fastened to the timbers, give the whole mass of the framing great stiffness, while the whole is very light in proportion to its power of resistance. On the top of the side sills, and forming a base board in the finished car, is a heavy plank, usually about 12 inches deep and from 2½ to 3½ inches thick. This plank, set up on edge, is bolted down to the sill and secured to each post in the wall of the car by two heavy lag screws. These two planks, which commonly carry the inside ends of the seats in day cars, add very much to the strength and stiffness. In the wall of the car, below the window sills, a system of bracing similar to that employed in bridges, is used to aid in holding the body up. Beside this, there are from two to six truss rods used under the bottom of the car, to hold up the center of the body and prevent the ends from getting down. In the parts we have mentioned, we have the entire resisting power of a car. Its whole strength may be said to be below the window sill. Above this point the car is a mere protection from the weather and a shield to prevent injury in case the car turns over. From this it will be seen that the top of the car needs but little strength above that required for sustaining its own weight and maintaining its position. In our best cars the roof is treated as a simple covering, and carlins and ribs (timbers of the roof) are as light as can be safely used for driving nails into, while roof boards are but little heavier than is necessary to sustain a man walking over them. On some roads the roof boards are secured by screws, and the parts are made lighter in proportion. Between each pair of windows are two posts, rising from the sill and extending upward to the eaves of the car. These are almost universally of ash, preferably of the straightest and best that can be obtained. When examining a car in the frame, a person would be apt to exclaim against attempting to build it with such light timbers. It must be remembered, however, that after leaving the floor every ounce added to the weight of a car is so much taken from its strength, because above the floor nothing that we put in adds in any considerable degree to the stiffness or resisting power. In spite of these light timbers, our car when finished, can almost be compared to a well made cask, it is so strong and tough, and, aside from floor framing, so light. This object is obtained by the panels with which the body is covered. The panels themselves are whitewood boards from one-half to three quarters of an inch in thickness. In a few cases we have known even thinner panels to be used. The panels which are put on to the body with screws, are bedded in white lead so as to get a perfect bearing, and when the lead hardens it adds greatly to the stiffness of the structure. Another plan of putting on panels is to use glue and nails, in which case the inside of the panel is "canvassed," or covered with a sort of open mesh burlaps, or coarse canvass. This is cut out considerably larger than the panel, so that when in place the edge of the canvass turns up, and is glued to the posts and other parts of the framing against which the panel may come. It is put on after the panel is in place. When the glue is dry the whole inside work of the frame receives a good coat of paint. A panel put on in this fashion is exceedingly tough, so that it is almost impossible to break through it by any ordinary violence. A sledge hammer is almost powerless against even a three-eighth inch panel, unless in the hands of an experienced man. The hammer will rebound from the surface with great violence, and the panel does not yield until repeated blows have splintered the wood and entirelydestroyed the grain. This elasticity gives the body a power of resistance not to be obtained in any other way. The whole body becomes a unit, since the wood breaks before the canvass can be separated from the panels or posts. Inside, the panel work adds great stiffness when properly put up, as it is in large sections glued together and strongly secured to the posts, sometimes by glue, but commonly by screws.

The roof, in addition to its wooden frame, has usually several braces of wood and iron combined ("compound carlins," an iron carlin between two of wood), which run across from one wall to the other. At the ends these carlins are tied to the side sills by rods running down between the windows. Other tie rods cross the car, while joint bolts, bands at the corners, straps over weak places, and rods wherever they are needed, make the whole structure so strong that no ordinary amount of battering cannot injure it, beyond taking off the paint and ornamental battens. Even these, when put on, as is the practice now, are hardly ever injured. They are thin strips of iron used to cover the joints between the panels, and are secured fast. Such a car, thrown from the track at thirty miles an hour, may be dragged a long distance along the ballast, may roll down a bank, or, as has often happened within our knowledge, be tossed off the track, landing on its roof beyond the railway fence in a field, and yet sustain no serious damage. Here we may remark that generally when people in such a car have the presence of mind to grasp the front edge of the seat and hold themselves firmly in their places, there is little danger of their getting hurt.

In mounting the body of a car upon its trucks, one point is of great importance, and that is the check chains. These are chains, usually one at each corner, which, while they allow the truck to turn sufficiently to pass any ordinary curves, will not allow it to turn at any considerable angle with the body. In a run off, the check chains, when properly secured, keep the trucks in line, and the car will not readily get across the track, nor will there be much danger of a wreck, because the train can generally be stopped in time to save it.

In comparing a car constructed on this system with a car of the kind commonly employed on English and Continental roads, it is obvious that the former has vastly the advantage in the matter of strength. When an American passenger car jumps the track, is tossed about and stood on its head—so to speak—the only injury to passengers, under ordinary circumstances, results from their being rolled about inside—stood on their heads, in fact. When a similar accident happens on an English road, panels, doors, running gear, sole plates, horn plates, roofs, broken glass and passengers are usually ground up together, and suffer about equal damage. On the 12th of last month the New York and Boston express train was thrown from the track by running over a horse at a crossing. Two sleeping cars were thrown from the track, and the first fell in a position at right angles to the rails. The other one turned over on its side tearing away a depot platform. The shock was terrific, but the damage done to the cars can be estimated from the fact that it was necessary to *break the windows with handspikes* in order to get the passengers out, none of whom were killed or very seriously hurt. An English car under such circumstances would have been broken into countless fragments, and those among the passengers who escaped alive would prob-

aby have been killed with excitement. As examples we refer to the Wigan and Shipton accidents.

Service Pipes.

The question of best material for service pipes is one of the most important that is met with in discussing the methods of plumbing; and it is becoming of greater and greater importance as the introduction of water works goes on. Almost every town in the country of any considerable size, has its water works, and, of necessity, the greater portion of dwellings and stores in them receive their supplies of water from the street mains. If health was in no way concerned, the matter would be a very simple one, for the lead pipe, taken all in all, would probably be the one universally preferred. Lead, from the facility with which it is bent and worked into shape, when cold, has been in all ages the favorite metal with plumbers. In fact, the name of the trade is derived from the Latin name for the metal, *plumbium*, and the plumbers were really lead workers.

With the exception of ease of working, however, lead would hardly have sufficient advantages to make one choose it as a material for a service pipe. Lead pipe is, under many circumstances, durable, easily handled and reasonably cheap; but it is weak and heavy, and is attacked by certain kinds of water, so that the pipe is quickly destroyed and the water flowing through it is poisoned. In other kinds of water it is harmless, exhibits a wonderful durability, and, except for its weakness, would be a very perfect pipe. But its very ductility is sometimes against it, because in long lines of straight pipe the metal is constantly stretched by the cold, and in warm weather the heat expands the metal and lays it up into waves or folds, as the case may be.

In the attempt to find something better than lead as a material for service pipes, block tin has been largely used, but with only moderate success. We use the term service pipe for convenience, to cover the whole service system for the distribution of water in a house. The tin melting at a comparatively low temperature (421° Fahr.) makes its use somewhat more difficult. It is harder than lead, yet, being less ductile, it does not work as well, and a job is not as easily executed with it as with lead. In some kinds of water the tin is rapidly corroded. Instances have come under our notice in which a pipe has been rendered useless in the course of a few years by having holes eaten through it. This was the ordinary block tin of commerce. Fortunately, the salts produced by the action of the water upon tin are not poisonous, and though the pipe may be destroyed, the health of those using the water is not thereby endangered. Tin, however, as a material by itself for service pipes, is hardly to be recommended, for, though it is safe, there are too many mechanical objections to it to make it a favorite with either plumbers or builders.

Tin-lined lead pipe has, within a few years, been very extensively used, and in many instances given great satisfaction. As now made, the interior coating is perfect, and if the joints are made as they should be, there is not the least trouble in regard to them. If, however, this pipe is worked in the same manner as lead, serious difficulties will be found. When well put up, there is little trouble. The lining is liable to be corroded by waters that attack block tin pipes. There is no trouble in making good joints by means of the tinned brass ferrule supplied by the manufacturers, but plumbers will not use them, preferring the solder joint, upon which they can overcharge without exciting suspicion. As the consequence, joints in tin-lined lead pipe are not, as the rule, well made.

Iron has been employed for service pipes in houses, with a good degree of success, but the danger of iron rust upon washed white fabrics, and the rapid decay of the pipe, makes it undesirable. The water coming through iron is not considered in any way injurious, even when a perceptible amount of the metal is present. The low price of drawn iron tubes, their great strength, and the ease with which they are put up, make them very desirable, provided they can be rendered durable by protection from rust. Galvanized iron pipes have been in the market many years, and of their utterly bad character for service pipes we have frequently spoken at length. In many cases the iron, imperfectly covered by zinc, is more rapidly eaten away than it would be if left entirely unprotected. In a great variety of waters used for the supply of towns, zinc is rapidly corroded, and the resulting zinc salts are highly poisonous. Many efforts have been directed toward tinning iron pipes, but serious obstacles in the way have prevented any successful application of tinning. The outside of the pipe could be very nicely coated, when desired, but on the inside exposed portions were sure to be left, or, the coating would be so thin as to allow the water to penetrate to the iron, and begin the work of corrosion when the thin film of tin would be displaced, and the iron beneath exposed. In this case the objection was a commercial one. The pipe was too rapidly destroyed to be used economically. Much has recently been said in regard to glass lined iron pipe, and, at first sight, the glass lining seems to be a very good thing, but there are several serious objections to its use. The glass is brittle, and in screwing the lengths home the twist of the pipe is likely to break the glass. Plumbers urge the difficulty and danger of handling iron pipe containing a brittle glass lining. They also state that the pipe cannot be conveniently cut to length, and hence is unsuitable for their work. There are certainly a great many chances against a common workman making a perfect job with a material of this character. We do not know how the glass would stand hot water, but we fear that it would soon be destroyed by unequal expansion. Theoretically, glass lined pipe is very good, but practically it is, we fear, utterly impracticable. Tar has been very successfully used for lining large cast iron pipes, and has been proposed for service pipes, but does not seem to have worked well in them.

The most promising thing that has come under our notice is the protection of an iron pipe by the insertion of a thin tin pipe inside of it. The tin pipe is drawn very thin, and of such a size that it can be pushed inside of the iron pipe. Hydraulic pressure is then applied to the inside of the tin pipe, which is expanded so as to firmly fit the inside of the iron pipe. The tin has a sufficient thickness to make the lining perfect. In cutting the pipe a drop of solder is run around the end to cover the iron. Tin and brass ferules are also made to go in the joints, so that when the end of a pipe is screwed into a coupling the iron is completely protected by the tin. The quarter turns and couplings are of iron tinned in the ordinary manner, and being of small size, there will be no difficulty in giving them a perfect coating. In protecting the end of a pipe that is to go into a coupling or quarter-turn, there are a variety of ways to be employed. We have cut pipe and left enough of the tin projecting to turn smoothly over the end of the pipe and cover it completely, which is better than the solder. In cutting the pipes it is best to use a special tool, and take a little care, but the time needed is no greater, if as great, as with the commoner tool. It has not yet been in service a sufficient time to enable us to give an opinion in regard to it, the first lot having been put up but two years since. It has stood this service well, and seems in good condition now. For convenience of putting up and in first cost there seems little to be desired. The matter is one of great interest and importance to our readers, and we shall watch its progress very carefully. From what we have seen and learned of it, we think it may be pronounced an important step in the direction of progress, giving us what we have never had before, a theoretically and practically perfect service pipe at a moderate price.

A respected correspondent writes to us as follows: "Can you not, in your paper, "impress the pig iron makers with the "necessity of blowing out their furnaces, "as the only remedy for an over production." We are always glad to present such facts to our readers as will aid them in forming correct opinions as to the future of the iron market and the policy most profitable for them to follow. We cannot, however, undertake to impress them with the necessity for anything, except caution, good judgment and close economy. It may be assumed that the owner of a furnace knows better than any one else whether it is best for him to continue it in operation or to blow out. If he does not, it is not probable he would take any advice or be influenced by any arguments. The Iron and Steel Association made an effort last year to decrease production by an agreement among furnace owners, but it was found impossible to induce any considerable proportion of them to sign an agreement, and the attempt was abandoned. We do not wish to repeat the unsuccessful experiment; furthermore, we do not believe it is our duty at this time to advise the blowing out of any stacks which the owners can afford to keep at work. The effort to avoid loss will prove a constant incentive to close and intelligent economy, and under such conditions as those now affecting the trade, furnace managers will learn more about making cheap iron in six months than they would be likely to learn in six years of great and uninterrupted prosperity. We believe that many and important contributions are now making to the metallurgy of iron, and that when prosperity returns, bringing an increased consumptive demand for pig, we shall be in a better position to take advantage of it than ever before. There is no reason why iron should not be made in this country at an average cost below the average selling price of the past twenty years, and the experiences through which we are now passing are well calculated to teach us how to make iron cheaply and at the same time profitably.

Coal and Iron in the United States.

Notes of a Visit to Coal and Iron Mines and Iron Works in the United States.*

BY MR. I. L. BELL, F.R.S.

(Concluded.)

It is not needful to describe, at any great length, the line of conduct pursued by the proprietors of iron ore mines. In principle it was the same as that of the coal owners, but, in some instances, it was of aggravated intensity. In these, the means of supply were in very few hands, and, in one case, those who controlled it have preferred seeing furnace after furnace extinguished rather than bring the resources of their property to market at a reduced price.

To show the combined effect of the influence as just related on the cost of production, I will give the expense of making a ton of pig iron at three different periods, obtained from a source I regard as entirely trustworthy. The first series of figures is for 1860, when the iron market was very quiet; the second is for 1871, the year preceding the period of great excitement; and the third is what it rose to in 1873, when extravagant profits were realized, and at which it is, unfortunately for the furnace owner, continuing at, long after profits of any kind can be counted upon:

	1860. £ s. d.	1871. £ s. d.	1873. £ s. d.
Coal, ore and limestone	1 15 9½	2 19 8	3 17 7
Labor	0 6 6	0 9 9½	0 10 4
Stores and other expenses	0 5 6	0 8 6½	0 10 8
	£2 7 9½	£3 18 0	£4 18 7

I may add that these figures are entirely confirmed by the information I received all through the Northern States, viz., that within a dozen years, the cost of pig iron had doubled, and further, that it could not be sold at the present time without entailing a loss to the producer.

From the maker of an article entering so largely into human requirements as iron, I was anxious to turn to hear how the consumer regarded the network which had been woven about him and which appeared to me, of necessity, to cripple his action. I accordingly addressed myself to the largest consumers—viz., the directors of railways and locomotive engine builders, believing that they could have no wish to have the cost of their rails or boiler plates increased by the payment of a tax to the State.

In this expectation I was disappointed, both declaring that, in their opinion, high wages enabled the working classes to move more freely about, and thus added to the general prosperity of railway companies and engineers. Now, undoubtedly, so far as cutting coal and puddling iron are concerned, the system pursued has been singularly successful, the operatives in both these branches having been able to earn from 20/ to 30/ per day during the year 1873. But it cannot be pretended that every branch of labor has to be similarly paid. The railway director cannot desire to excavate his line, cut his sleepers, man his stations, and run his trains with wages based upon such a scale of pay.

Another advantage these protective duties were alleged as possessing was the contribution they afford to the revenue of the State; in other words, in the case of iron, that they who use most of this metal pay more than their share of the national expenses. This argument, however, is perhaps the weakest of all when it comes from the mouth of an iron master, because his object in asking for a high tariff is not to pour money into the national treasury, but to curtail this to its smallest amount by reducing the quantity of iron upon which the duties are levied to its lowest possible figure; in short, the iron manufacturer seeks to avoid foreign competition by excluding its importation entirely.

Leaving, however, the question as to whether an industry, having to contend with disadvantages peculiar to itself, is entitled to receive from the State any protection of the description just mentioned, let us briefly consider whether, in the case of the United States, this protection is in reality required in the manufacture of iron.

The supposed disadvantages in the case of the United States may be considered as arising either from dear labor or physical impediments connected with procuring or bringing together the raw materials, added to difficulties in sending the produce to market.

In *The Iron Age* of 22d October of last year, an ably conducted journal, dealing especially, as its name would indicate, with the metallurgy of iron, is an article entitled "Why England Suffers from Foreign Competition."

The chief reason why we suffer, according to this authority, is, that we are no longer able to command what the writer designates as "pauper labor," and this so-called pauper labor has caused British manufacturers to neglect keeping pace with the progress of the times, which neglect has led to our overlooking to afford any "encouragement to inventive talent to devise labor saving machinery."

If this language is intended for the British manufacturers of iron, its author must be but imperfectly acquainted with the real circumstances of the case, for, in his comparison, he draws a distinction between the Continent of Europe and our own island. When I say that the rates of wages are at the present moment, and in last October were, and always have been, much higher with us than in any iron making center on the Continent, I am merely stating a fact which has been remarked and commented on by every writer on the subject for the last 25 years. To the statement that "labor saving machinery" has been neglected, I have only to observe that the extent to which, in spite of higher wages, we reduce our expenses of manufacturing to the level of the cost of our neighbors, has been the subject of admiration to every Continental iron master who has visited our furnaces and mills. Indeed, and this, perhaps, will carry more weight with *The Iron Age* than French or German approbation, some of my American friends have considered it expedient to introduce in the most recently erected blast furnaces some admirable lessons they generously admitted they had learnt in England.

It is, however, a fact, and anti-free trade apostles would do well to remember it, that our commercial policy has had an effect upon the state of affairs with our immediate neighbors. Our large importations of food have conduced to a rise in its value abroad, and, as a result, wages there, from this as well as other causes, have, during recent years, been gradually advancing. In like manner, the great inducements which the American iron masters held out to emigration from this country have produced a sensible effect upon the cost of labor with us. Pig iron, at ten pounds a ton, no doubt affords an immense margin in this respect, but as soon as commerce is made fully sensible of this heavy load, the demand falls off, and the current of emigration is arrested—indeed, it may be said, is reversed, for a certain number of workingmen are returning from America to their native country.

Of course, it is possible, as it is proper, that the United States should enter into the market and bid against ourselves for labor; that they will do, without any regard for our "sufferings from foreign competition;" but that they should do this, and then require that their own people should submit to a heavy tax, in order that they might pay extravagant rates of wages, will be regarded by us, as it is by very many among themselves, as a piece of very questionable policy.

Admitting for a moment the expediency of encouraging the introduction of a new manufacture, or even of discouraging external competition by the levying of import duties, so as to place both on a position of equality, is the iron trade of the United States entitled to such a position? The mineral resources of that country are of unquestionable extent, but so are our own, and they will remain so for centuries to come. With labor on anything like equal terms, it is a physical impossibility that iron can be made more cheaply in the United States than it can in England. For this labor the iron makers there can and will bid with ourselves, but they may pursue this course to their own disadvantage. I would ask those who are disposed to deny the justice of this statement, to reconcile the position of the iron master there of a dozen years ago, who carried on, at all events, a moderately successful trade, with pigs at not much above half the price of the present day. Since that time the science of iron making has made considerable progress, and, notwithstanding, the cost of production has more than doubled, owing either to the immense increase in the price of labor, or to these artificial barriers to commercial progress to which allusion has already been made.

If my information as to former cost be correct, then I say that it is one against which no British maker at that time could compete, looking at the charge for freight he would have to meet before he laid down his ton of iron alongside that manufactured by the American iron master.

If the truth of these statements is conceded, the Lehigh furnace owners ought to be able, with their natural facilities, and with labor at some increase on its former cost, to meet us in New York upon more than equal terms, while those of the Cleveland, Pittsburgh, Hanging Rock, and other Western regions, can hold their ground successfully against us, by virtue of the land carriage which, in addition to that by sea, we must incur before we can deliver our iron at their doors.

So far I am taking no account of the comparatively undeveloped resources of Tennessee, Georgia and Alabama, which will, as I have already indicated, prove a match for any part of the world in the production of cheap iron, and this brings me to considering upon what principle a protective duty on the importation of iron into America has to be levied. Has it to be in amount sufficient to protect the puddler, who received, in 1860, 12 3 per ton for his work, or must it be raised so that he may continue in the receipt of nearly three times this price; or has it to be regulated by the inability of the furnace owner to meet competition with pig iron under £5 a ton, although he himself, a dozen years ago, could make it for 50/, there being nothing in the powers of supply of coal or ore to account for the change? We are not, indeed, compelled, for the purposes of this argument, to compare the present with former times, for there seems every reason for believing that pig iron can now be laid down in the Southern States mentioned above at little above one-half the cost of that made in the North. Has the consumer in Alabama or Tennessee to pay for his metal, made at 50/, £5 or £6 a ton, because the smelter elsewhere, owing, as I think, to artificial reasons, cannot afford to sell it without loss at a lower price.

Notwithstanding, however, the protestations in favor of the system of protective duty, there seems to dwell in the minds of its adherents a suspicion that the reverse may, after all, be more sound in principle. Whether I am correct in this supposition or not, our friends of the Western Hemisphere, if not admirers of our commercial freedom, are not unwilling to avail themselves of its advantages.

Annually the American Iron and Steel Association sends out a report, giving ample and very valuable information connected with the position of affairs affecting these trades. That for last year has just been issued, and it contains abundant proof of the ability and assiduity of the courteous secretary of that body, and marked by both these attributes is his advocacy of protection to the native industry of his own land. I gather, however, from his remarks, that our native industry may safely be left to take care of itself.

As we all know, there are several works in the West Riding of York employed chiefly in the manufacture of the finer kinds of wrought iron, particularly that used for railway carriage wheels. In America the material used for this purpose is cold blast charcoal pig iron, and a document, quoted by the American Iron Masters' secretary, congratulates the trade on the fact of 100 tons of this pig iron having been sent here in the hope of displacing the native make of our Yorkshire friends. Nay, so intent is the authority quoted in the "Report" to undertake every office connected with the introduction of "car wheel iron" into England, that he appears not to be willing to rest satisfied until the whole of these requirements of this commodity is conveyed to our shores in American vessels.

We will promise no impediment to the realization of these wishes. We use American oak, though we have heard of British, in constructing our railway carriages, because it suits our convenience. For the same reason, these carriages may run on wheels of American car wheel iron, if it is better than Yorkshire brands, and we have no intention of refusing either oak or iron, even if they are brought to us in vessels carrying the American flag.

Among the best signs of a nation's power and proficiency in manufacturing science and skill, is the position it is able to assume in exchanging those commodities, natural and otherwise, which circumstances have placed within its reach, for those in the production of which other countries possess superior advantages. It is, therefore, with very justifiable pleasure that the Secretary of the American Association calls attention to the increase of exports as exhibited by the custom house returns of the United States, and particularly by those in which iron and steel enter largely.

This gentleman, however, is too cute not to see that after asserting that the American ironmasters require for their very existence a high protective duty to be levied on British iron, there is a little inconsistency in their being able to export locomotive engines in competition with British manufacturers, and this inconsistency is rendered the more conspicuous when we are told that these very locomotives pass our shores on their way to St. Petersburg, the place of their destination. And how is this apparently unsurmountable difficulty accounted for? The high tariff of the United States gets the credit for it. High prices enable the American ironmasters and machine makers to pay high wages, which has so fostered the inventive genius of our relations across the water, that the economy with which they can construct machinery, and its excellence when constructed, render them able successfully to compete with the old country.

No one can deny the existence of great ingenuity on the part of the American mechanicians, and I deemed it simple justice to place their achievements as a worthy continuation of what had been effected in this country by their ancestors, and pursued since by their cousins.

Admitting, however, the truth of the language of the report, let us see where it lands us. A locomotive manufacturer, say in Philadelphia, receives into his establishment dearer iron and dearer steel than does a house, say, in Newcastle-on-Tyne. By dearer labor, but with greater skill, out of these he builds his engine, pays a higher freight, and undersells our Stephenson's and our Hawthorn's, in St. Petersburg.

I have described to you beds of coal and mountains of ore, as they exist in America, which the world itself may be challenged to beat. Are the iron consumers of that great country, not we, entitled to ask that a portion of that ingenuity which enables one of their locomotive engine builders, under considerable disadvantages, to compete with us, should be applied to the manufacture of iron? which manufacture commences under natural conditions, to say the least of them, equal to those possessed by ourselves.

We are further informed by the document I am considering, that no humane and patriotic American wishes his men to work for low wages. I cannot say that I gained, during my visit, any clear idea of what is meant in the abstract by low wages, but I can safely assert that in discussing the labor question in America, I could not detect any difference between the sentiments expressed by the ironmasters on the two sides of the Atlantic. That there is a limit even to the liberality of our American colleagues, I presume will not be denied, otherwise, how can we account for a nine months' strike among the puddlers at Pittsburgh, when it was proposed to reduce the price from 34/ to 30/ per ton, or for the presence of an armed force among the anthracite pits at Hazelton, to keep the miners quiet, who, in the matter of a proposed reduction of wages, do not seem to agree with what is just, not to say liberal, on the part of their employers.

The report condemns, to some extent, the adoption of improvements rendered necessary by the progress of the day. "As well ask," it continues, "the owner of a square piano to destroy it, because it is not a grand piano." Perhaps, so long as the musician plays for his own amusement, no one would find fault with his holding by his old fashioned instruments, but to compel an audience to pay and listen to inferior music, when better was to be had, would be an argument addressed to unwilling ears.

After all, however, the current which will compel the remodelling of iron works needs no foreign country to set it in motion in the United States. The enlarged furnaces erected in its different localities, and the admirable improvements effected by Holley and Fritz in rolling mills and Bessemer plant, will have their effect on those to whom circumstances render advance a matter of difficulty. It may be that "the policy which crushes the weak and exalts the strong" is not desired by the former, but it is an inevitable one in the history of industry.

In a political point of view no argument can be, as I believe none will be, advanced by the North against the development of the iron resources of the Southern States, and yet it is by no means impossible that some less favorably situated works in the former may suffer more by the competition which, before long, may spring up nearer home, than from any that we, in this country, are able to offer.

It is not, however, needed that we should seek, on our side of the Atlantic, for what to me seems sounder doctrine than that propounded by the Secretary of the American Iron and Steel Association, for these are the words of the president himself of that body in his last annual address, delivered on 11th of February of this year:

"Now is the opportunity to prepare for new efforts. Old processes must yield to better ones. Old machinery must be pulled down and better devices substituted. Intelligent economy must now be the order of the day, and our old method of puddling and rolling and heating must undergo a thorough examination and revision. If the Danks' furnace has not come up to what it promised, our inventive powers must be called into action to supply its defects or supplement it with something better. The Siemens and Ponsard heating furnaces, wherever used, have given better and more economical results than the old style of furnaces, &c."

The president then goes on to speak in commendation of breaking "down the barriers which have hitherto existed between the iron masters of the two countries of Great Britain and America," by which "each will learn to respect and emulate the other, and no doubt the advantage will be mutual."

The first of these sentiments will, I am sure, meet with a ready and warm response in the breast of every member of the Iron and Steel Institute of this empire, and I would offer my judgment, for as much as it may be worth, in assuring you of the entire truth of the second aspiration of my friend Mr. Reeves.

Plating with Aluminum.—According to John A. Jeancon, of Newport, Ky., metal surfaces may be plated with aluminum by the following process with great facility: Dissolve any desired quantity of a salt of aluminum, such as sulphate, muriate, nitrate, acetate, cyanide, etc., in distilled water, and concentrate the solution to 30° Beaume (at 50° Fahrenheit), in a suitable vessel to hold the article to be plated. The battery to be used should either be four pairs of Smee's zinco-platinum, of three of Bunsen's zinco-carbon, with the elements connected for intensity, and a plate of aluminum attached to the negative wire. The solution should be slightly acidulated with its appropriate acid, heated to 140° Fahrenheit, and kept at that temperature during the operation.

One of the great railroad companies of England purposes buying the Blænavon Iron Works for the purpose of manufacturing rails and other iron.

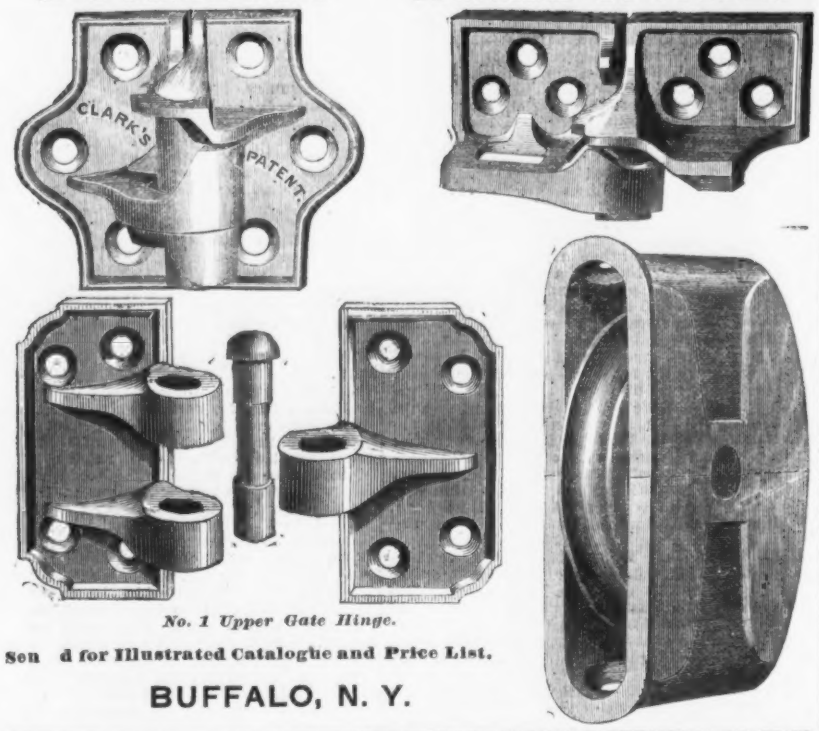
A telegram has been sent from this city to London, and an answer received in 30 minutes actual time. Each message traveled 3600 miles, and passed through the hands of 18 persons.

* Paper read before the Iron and Steel Institute.

CLARK & CO.,

MANUFACTURERS OF

BUILDERS' HARDWARE.



No. 1 Upper Gate Hinge.

Send for Illustrated Catalogue and Price List.

BUFFALO, N. Y.

Wellington Mills London
EMERY.

SALE AGENCIES:

Macomber, Bigelow Dowse,	Boston, Mass.
Homer, Foot & Co., -	Springfield, Mass.
C. Foster & Co., - -	Worcester, Mass.
J. Clark Wilson & Co.,	New York City.
Chas. M. Ghriskey, -	Philadelphia, Pa.
Belcher Bros., - -	Providence, R. I.
Baeder, Adamson & Co.,	Chicago, Ills.
Baeder, Adamson & Co.,	Cincinnati, Ohio.
Clemens Vonnegut, -	Indianapolis, Ind.

Sold generally

BY ALL PRINCIPAL DEALERS IN

Hardware

IN THE UNITED STATES.

WELLINGTON MILLS, LONDON
GENUINE LONDON GROUND EMERY.
GEO. H. GRAY & DANFORTH,
BOSTON, MASS.,
Importers.

CENTENNIAL
SELF-LUBRICATIVE

Hemp Piston Packing

FOR

Locomotives, Steamships, Stationary Engines, Hot or Cold Water Pumps.

☞Recommended by Master Mechanics and Engineers, as the cheapest and best in market. **No more Extortionate Prices. No more Fluted Rods**—but a good article at fair price.

JOHN CANFIELD & CO.,
SOLE MANUFACTURERS,
Office, 1321 Fairmount Ave., Phila.
PATENT APPLIED FOR. Send for Circular.

CENTENNIAL PISTON PACKING. 1776 1876 TRADE MARK.

NEW MODEL DERINGER REVOLVER.

22 Cal. 7 Shot.

An exact model of S. & W. No. 1 Revolver.

This arm is Half Nickel Plated, and is equal in style of finish to the best arms in the country. Quality of workmanship and material first-class, and guaranteed in every respect.

Price less than any other Hinge Barrel Cartridge Revolver in the market.

Sole Agents, EDWARD K. TRYON, Jr. & CO., { Dealers in FIRE ARMS.
No. 19 North Sixth Street and No. 220 North Second Street, PHILADELPHIA.

Trade

The "Swift Mill."

Mark.

AWARDED TO Lane Bros For the Swift Mill 1874.

AMERICAN INSTITUTE. NEW YORK

HIGHEST AWARD SILVER MEDAL at the last Fair of American Institute, N. Y. The best ever made. Made from 8 different styles and modified one suited to Grocers and others. Full catalogue on application to the manufacturers

LANE BROS., Millbrook, Dutchess Co., N. Y.

Or their General Agents, S. HAVILAND & SON, 259 Pearl St., N. Y. Also sold by the Hardware Trade

THE CUNARD COOKING STOVE,

With an improved construction of Reservoir for Hot Water, The New Automatic Hot Air Flue, Clinkerless Grate and Illuminated Front, and with the New Patent Ash Sifter.

FOR ANTHRACITE or BITUMINOUS COAL or WOOD.

Manufactured by

Perry & Co.,

ALBANY, 115 Hudson Ave. NEW YORK, 86 Beekman St. CHICAGO, 15 & 17 Lake St.

Established in 1839.

A. G. COES & CO.

WORCESTER, Mass.,

Manufacturers of

THE GENUINE

COES'

SCREW WRENCHES.

Our goods have been very much improved recently, by making the *Bar WIDE*, as shown in the cut, which makes a 12 in. Wrench as strong as a 15 in. made in the ordinary way, and by using

A. G. COES'

NEW PATENT

FERRULE

Which cannot be forced back into the Handle.

☞Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 29, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be *vigorously prosecuted.*

We call particular attention to our new Patent Ferrule, with its Supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.

A. G. COES & CO.

HOISTING Machinery

Mfd. by

CRANE BROS MFG. CO.,

Chicago.

R. J. BRITTAIN,

Manufacturer of

TELEGRAPHIC INSTRUMENTS,

Burglar Alarms, Call Bells, &c.

NICKEL PLATING DONE TO ORDER.

118 Bergen St., Newark, N. J.

N. B.—A Specialty made of Experimental work.

NOVELTY ICE BREAKER.

THE BEST IN USE.

SAVES TIME, ICE AND ICE BOX,

aving Four Steel Points, it Splits the Ice without Wasting. No Pounding with the Hand.

IT SHOULD BE SEEN AND USED TO BE APPRECIATED.

CAPEWELL'S
GIANT NAIL PULLER.
Saves Boxes, Nails and Labor.

Sold by all House Furnishing and Hardware Jobbers.

MALTBY, CURTISS & CO.,
MANUFACTURERS,
34 Reade Street, New York.

BILLINGS & SPENCER CO.

MANUFACTURERS OF

CLAMP, DIE AND COMMON

LATHE DOGS.

Vienna, 1873.

For Progress.

Forged from Bar Steel And Hardened

Under Billings's Patent Process.

FIRST CLASS ARTICLES,

and something that every machinist and Tool Maker will appreciate.

Also, all Descriptions of **Wrought Iron & Steel**

DROP FORGINGS.

For Machine Handles, Lathe Wrenches, Spinning Rings, Marlin Spikes, Clinch Rings, Thumb Screws, Thumb Nuts, and Parts of Drill Chucks, Sewing Machines, Guns, Pistols, and

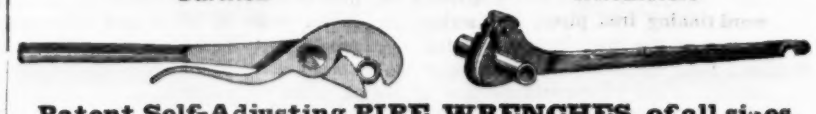
Machinery Generally.

TRADE B MARK.

THE BILLINGS PATENT SEWING MACHINE SHUTTLE,

Thirty Varieties now made, Forged Solid from Bar Steel and Cold Pressed. Also,

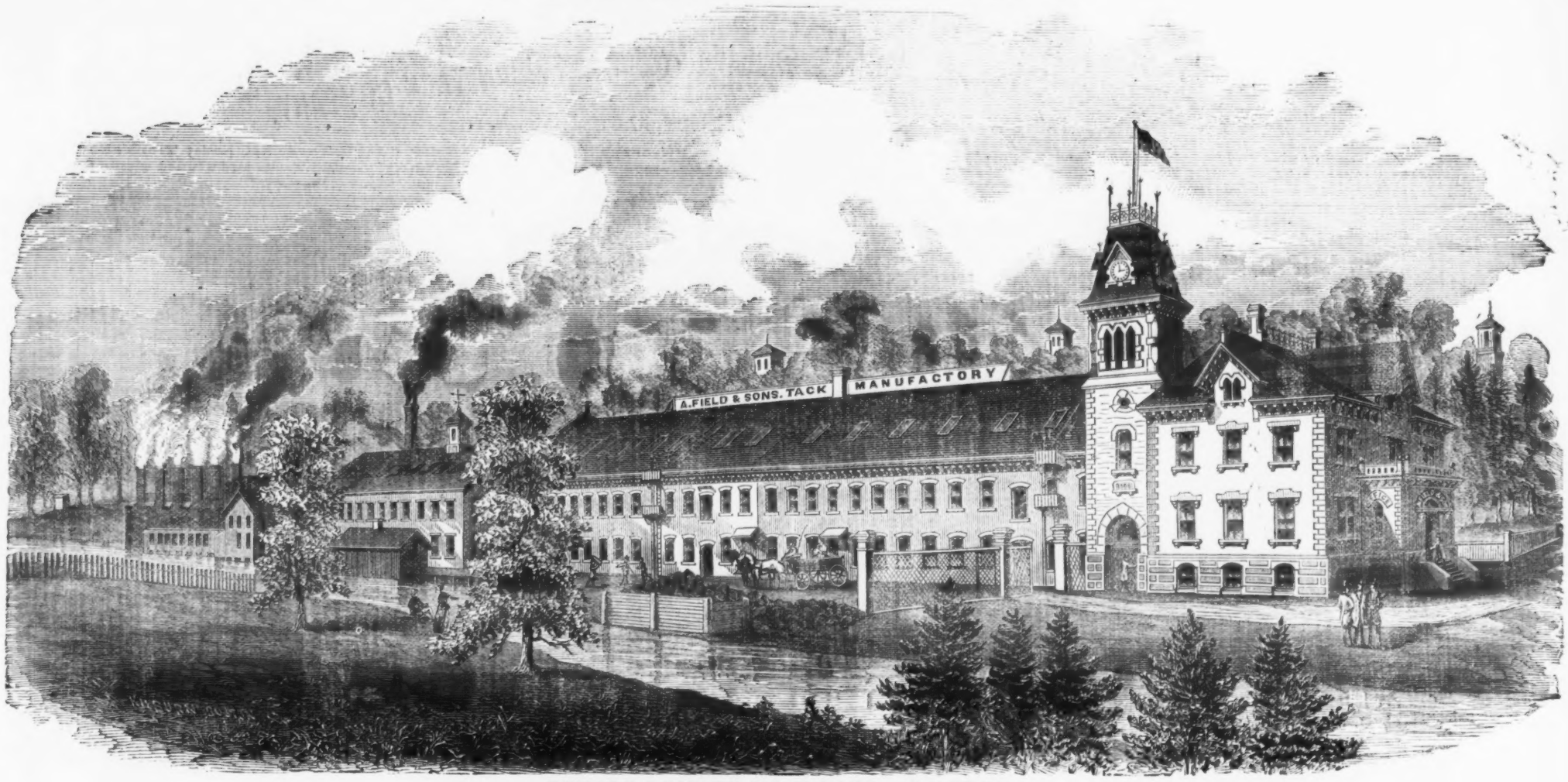
Barwick Wheatcroft



Patent Self-Adjusting PIPE WRENCHES, of all sizes.

Illustrated Circulars and Price List sent to any order on request. Lawrence St., Hartford, Conn

ESTABLISHED 1827.



ENTIRE LENGTH OF WORKS, 700 FEET.

A. FIELD & SONS,

TAUNTON, MASS.

Manufacturers of

IRON
COPPER
TINNED
SWEDES IRON
UPHOLSTERERS'
CARD CLOTHING
PAIL and TUB
GIMP
LACE
Patent Copper Plated
Large Head Carpet

TACKS

TACKS

Leathered Carpet
TINNED CARPET
Colored Coated Carpet
COFFIN LINING
MINERS'
BRUSH
LOOKING GLASS
SHOE or LASTING
ROUND HEAD
ROOFING
Every Style of

QUALITY GUARANTEED TO BE SATISFACTORY.

SILVER OR JAPANNED LINING AND SADDLE NAILS, TUFTING NAILS AND BUTTONS.

American and Swedes Iron Shoe Nails, Zinc and Steel Shoe Nails, Common and Patent Brads, Finishing Nails, Annealed Trunk and Clout Nails, Hob and Hungarian Nails, Copper and Iron Boat Nails, Patent Copper Plated Nails, Fine Two Penny and Three Penny Nails, Channel, Cigar Box and Chair Nails, Etc.

With New, Improved, and Patented Machinery, we shall now make

GLAZIERS' POINTS,

ONE OF OUR SPECIALTIES.

Any variation from the regular size or shape of the above named goods made from samples to order.

OFFICES AND FACTORIES, - - - - - - TAUNTON, MASS.

Warehouse and Salesroom at 78 Chambers Street, New York.

TACKS & SHOE NAILS made by the AMERICAN TACK COMPANY.

FACTORY, Fairhaven, Mass. - - SALESROOM, 117 Chambers St., N. Y.

Upholstery, Gimp, Brush, Card, Pail and Cheese Box Tacks; Leathered, Tinned and Iron Carpet Tacks; Bright and Blued Finishing Nails; Cigar Box and Chair Nails; Trunk and Clout Nails; Brads, Patent Brads, Copper Tacks and Nails; Iron, Zinc, Steel and Copper Shoe Nails; Polished 2d and 3d Fine Nails; Roofing and Slating Nails; Roofing Tacks and Tinned Tacks and Nails of every variety. Any size or style of Tack or Nail made to sample. Orders sent to either Factory or Salesroom will receive prompt attention.

HISCOX FILES AND RASPS,

Address, HISCOX FILE MFG. CO., Lowell, Mass.

GEO. M. EDDY & CO.,
Manufacturers of **Measuring Tapes,**
353 Classon Avenue, Brooklyn, N. Y.

Manufacturers of Paine's Patent Steel Standard Measuring Tapes, for Surveyors, Engineers and Mechanics requiring a correct measure of great length according to U. S. Standard. Also of Tape measures for the same trades, Lumbermen, Machinists, Tailors, Shoemakers, Dressmakers &c. Catalogues on application.

Vase Medallion B. Burner.

NO CHIMNEY KEROSENE LAMP
WITHOUT SMOKE OR SMELL.

Light equal to gas. Adapted to Dwellings, Churches, Factories or Public Buildings. Breakage of one chimney per week will pay for Lamp in one year. Every Lamp guaranteed for one year. Liberal discounts to trade.
PATENT MECHANICAL LAMP CO., 138 Chambers St., N. Y.

A. PARDEE, Hazelton, Pa. J. G. FELL, Phila.

A. PARDEE & CO.,
303 Walnut St.,
PHILADELPHIA
MINERS AND SHIPPERS OF
Lehigh Coals.

The following superior and well-known Lehigh Coals are mined by ourselves, and firms connected with us, viz.

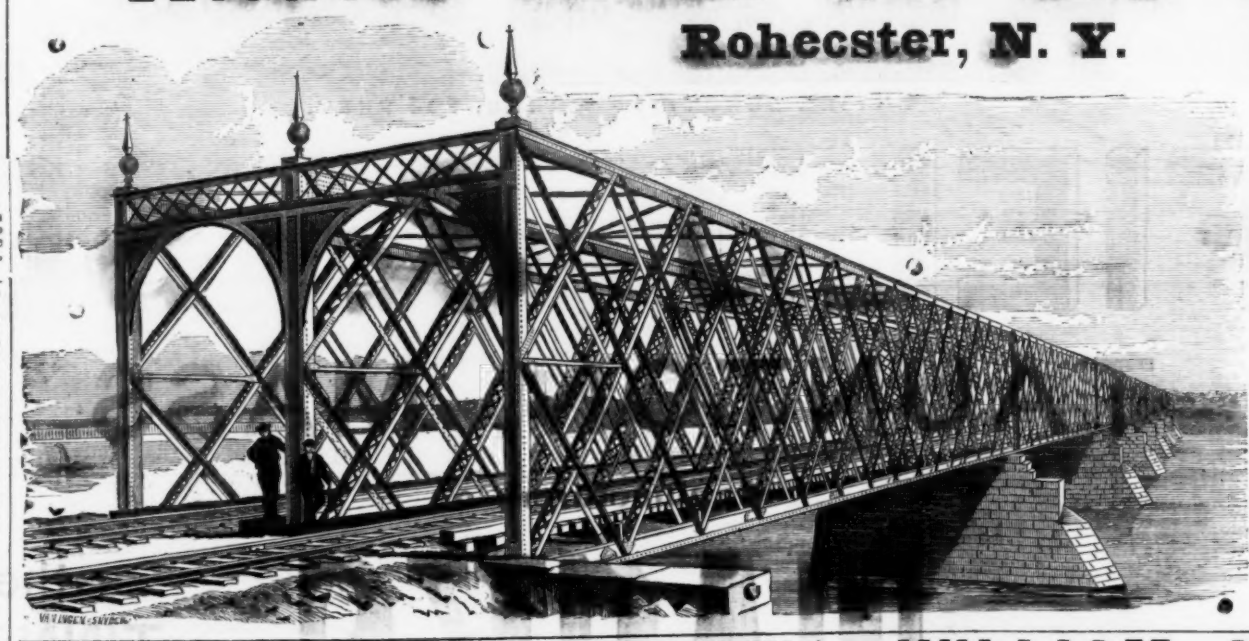
A. Pardee & Co. { HAZLETON. CRANBERRY, SUGAR LOAF
G. B. Markle & Co. { JEDDO, HIGHLAND.
Pardee, Bro. & Co. LATTIMER.

OFFICES:
WM. LILLY, Mauch Chunk, Pa.
WM. MERSHON, Agent, 111 Broadway N.Y
WM. H. DAVIS, Agent, Easton, P

GEORCE FOCHT,
Iron Foundry, Machine & Sheet Iron Works,
First and Adams Streets, Hoboken, N. J.

Inventor, Patentee and Manufacturer of the Celebrated Self-dumping Hoisting Tubs, Iron, Coal Cars, side or bottom dumping, Iron Dock and Hook Blocks, Iron Sheaves, with or without Steel Friction Rollers for Chain, Wire or Hemp Rope, of every size and description. Iron Box Wheelbarrows, Coal and Coke Barrows, Charging Scoops, etc., for Gas Works, and Sheet Iron Work in general. Improved Mast Shoe and Gaft Socket Castings, and complete Iron Work for Mast and Gaft made to order and put up if desired. Machinery, Building and other Castings on hand and made to order. Illustrated Circular and Price List sent on application.

LEIGHTON BRIDGE AND IRON WORKS,
Rohecster, N. Y.



Wrought Iron Riveted Lattice Railroad
AND
HIGHWAY BRIDGES.
Wrought Iron
WATER PIPE,

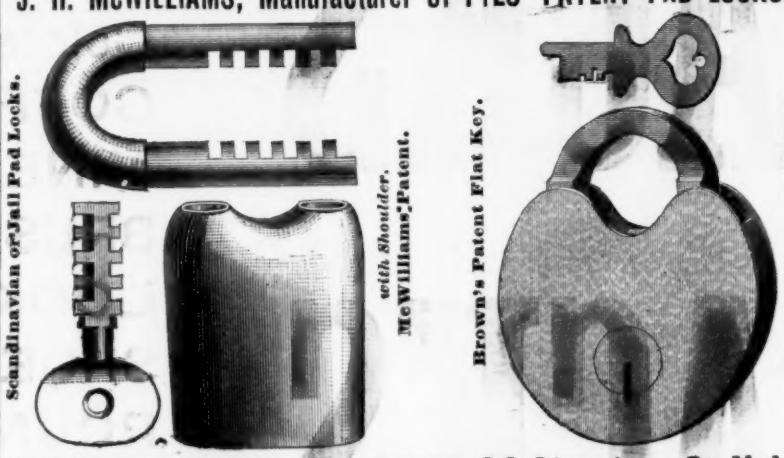
The most economical and durable Pipe manufactured for Water Works, Oil Lines or Gas Mains.

General Riveted Work

Orders solicited from Civil Engineers and Contractors.

[Accompanying engraving represents the Springfield Bridge, built by the Leighton Bridge and Iron Works.]

J. H. McWILLIAMS, Manufacturer of PYES' PATENT PAD LOCKS.



JOHN J. TOWER, Sole Agent, 96 Chambers St, N. Y.

EDWARD PHELAN,
Surviving Partner of W. F. SHATTUCK & CO.,
No. 113 Chambers and 95 Reade Streets, New York,
MANUFACTURER OF AMERICAN HARDWARE.

Coes & Taft's Pat. Wrenches.
Axe, Pick, Sledge & Hammer Handles.
Gimlets and Gimlet Bits.
Augers and Auger Bits.
Cocoa Nut Dippers.
Wire Seives.
Scale Beams.
Patent Tap Borers.
Brundage Horse Nails.
Maguire's Wr't Iron Goods.
Shattuck's Platform Counter Scales.
Yaw's Cow Bells.
Axes, Picks and Hatchets.

Coopers' & Turpentine Tools.

Coopers' Drawing Knives,
Coopers' Adzes and Axes,
Coopers' Froes,
Stocked Croze and Irons,
Coopers' Jointers,
Truss Hoops, all sizes.
Turpentine Hackers,
Turpentine Shavers,
Turpentine Scrapers,
Turpentine Axes,
Turpentine Dippers,
Hacker Stones and Files.

FOR SALE BY
N. WEED, 4 Gold St., N. Y.

RHODE ISLAND HORSE SHOE CO.,
OFFICE, 81 Canal Street, Providence, R. I. WORKS at Valley Falls, R. I.
Manufacturers of
PERKINS and RHODE ISLAND PATTERNS of
HORSE AND MULE SHOES.

WILLIAM A. DODGE,
Commission Hardware,
96 Chambers Street, New York City,
AGENT FOR

American File Co.'s Files.
J. M. King & Co.'s Stocks and Dies.
Blake Bros.' Butts, Pullies, &c.
Greenfield Tool Co.'s Planes.
M. S. Brooks' Screw Eyes, Hooks, &c.
Watson & Co.'s Cotton, Wool & Horse Cards.
Threadle's Try Squares, Bevels and Rules.
J. P. Verree's Hammers and Edge Tools.
Judd & Blakeslee's Snaps, Sash Fasts, &c.
H. Wilkinson's Mincers and Screw Drivers.
Bliss & Co.'s Hand and Bench Screws.
T. T. Rhodes' Saw Handles.
American Screw Co.'s Rivets and Screws.
Stillman's Saw Sets.
Dodge's Kentucky Cow Bells.
Holroyd & Co.'s Stocks and Dies.
C. S. Griswold, Augers and Bitts.
Romer & Co.'s Pad Locks.
Wm Cleveland, Star Faucets.
Bullock's Babbitt Metal.
Cowles' Hardware Co. Mincers, &c.
Robbins' Cotton Lines.
Amidons' Braces.

Patent Reservoir Vases and Hanging Baskets.
REDUCED PRICES FOR 1875.

These Vases are constructed with a reservoir base to contain water, which is drawn up into the vase by capillary attraction, keeping the earth sufficiently moist for ten to twelve days without attention. The advantage of this feature for **CEMETERY USE** will be readily seen. Send for circular giving styles and sizes.

The **HANGING BASKETS** are made on same principle, the reservoir bottom being spun of zinc, handsomely japanned and decorated in various colors. There is no danger of their drying up; no necessity for taking them down to be watered; no dripping after watering. Manufactured by

CHARLES E. WALBRIDGE,
297, 299 & 301 Washington St., BUFFALO, N. Y.
Wholesale Agents. { FERNALD & SISE, 100 Chambers Street, N. Y.
KELLOGG & KING, Detroit, Mich.
C. HENECKE & CO., Milwaukee, Wis.

REVOLVING SCRAPER CO.,

OF

COLUMBUS, O.

Manufacturers of DOTY'S REVOLVING ROAD and LEVEE SCRAPER.

FOR

Earthwork, Excavations & Embankments

OF ALL KINDS,

ROAD MAKING,

DITCHING,

DRAINING,

And moving Earth, Sand or Gravel,

NEEDS BUT A TRIAL TO ENSURE THEIR CONTINUED USE.

DURABLE, STRONG, CHEAP.

"MAMMOTH" R. R. PLOW,

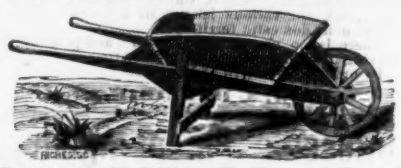
"Automatic"

Doty's Revolving

Iron or Steel Bottom.

One Hundred Revolving Scrapers at work on the Union Levee, near Cincinnati, O.

SEND FOR CIRCULARS AND PRICE LISTS.



Jacob's Patent Self-Oiling R. R. and Canal Barrow.

20,000

ARE ALREADY IN USE.

SAVES

TIME.—Rights itself after dumping its load.

LABOR.—Only one man needed to do the work. No "fillers" needed.

MONEY.—Does more work in the same time than any others.

Jacob's Pat. Wheelbarrow

"Automatic"

Doty's Revolving

Wood Bot

Office, Room 5, Deshler Building, corner High and Town Streets, Columbus, O.

AMERICAN LOCK MFG. CO.,

Manufacturers of

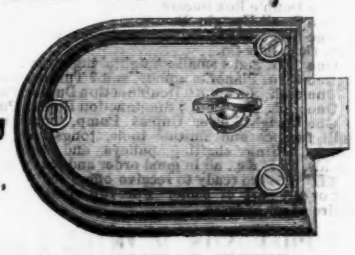
FELTER'S

Locks & Latches,

Comprising

Store Door Locks, Night Latches, Drawer, Desk and Pad Locks,

All of which are furnished with



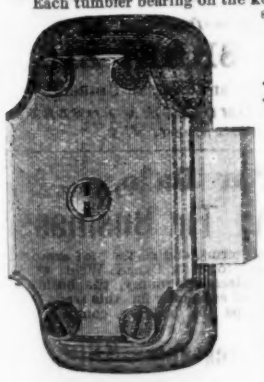
SMALL, FLAT, AMERICAN STERLING METAL KEYS,

Which are stronger than steel, ***and cannot be affected by rust,*** and will remain bright and clear under all ordinary circumstances.

A candid examination will convince the most unbelieving, that for simplicity, durability, convenience, and safety, they challenge comparison with any now before the public. Being made entirely by new and expensive machinery, especially constructed to manufacture them, ***they will rival the best made Locks in Finish and perfect operation.***

These Locks give perfect satisfaction, because they are the safest, cheapest and most durable Lock ever presented to the public, having ***thirty-five*** finely finished Brass Tumblers in each Door, and twenty-eight in each Drawer Lock, each one being finely false notched.

Each tumbler bearing on the key at two different points while locking or unlocking, without the aid of springs which cannot be said of any other patent Tumbler Locks in use.



THE LOCKS ARE FITTED TO THE KEYS,

And not the Keys to the Locks.

Hence Counterfeit Keys cannot be made.

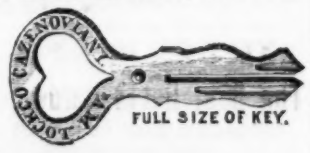
For descriptive list and terms, address

AMERICAN LOCK MFG. CO.,

OFFICE and WORKS, Cazenovia, N. Y.,

Or, **UNION NUT CO., Agents,**

78 Beekman Street, New York.



FULL SIZE OF KEY.

Gooch's Patent Ice Cream Freezers,

ZERO REFRIGERATORS,

EMPIRE AND MONITOR LAWN MOWERS,

Hildreth's Patent Self-Adjusting and Self-Fastening

Bit **Brace.**

The most convenient Bit Brace ever made; instantly adjusting and fastening any Bit without previous fitting.

CROQUET at low prices, **TRELLISES, CROQUET-SETTEES,** with folding Tent Covers, **FLORISTS' GOODS, NICKELED TABLE WARE.**

G. WEBSTER PECK, Manufacturers' Agent, 110 Chambers St., N. Y.

Send for Price Lists—enclosing business card.

Influence of Mining Industries on Civilization.

Prof. J. E. Clayton says: Before man learned to mine and work the metals, he had to depend upon the use of implements made of stone, wood, bone, and horn, for weapons of defense and offense against the wild beast of the forest, and neighboring hostile tribes. For long ages the early races of men knew nothing of metals. Stone hatchets, stone knives, and articles of bone and horn are found in abundance in the old drift deposits of Europe and America, but no traces of any metallic implements in the early haunts of primeval man.

The first stept in the advancement of the human race was made when native copper (and perhaps silver) was discovered, and came into use for weapons and domestic purposes. The tribes that first used copper were able to overpower their neighbors on account of the superiorty of their class of arms for destruction, and it is fair to presume that the localities from which copper was derived were guarded with jealous care to prevent their neighbors from supplying themselves with like materials.

The Aztecs and Peruvians carried the manufacture or bronze to great perfection; their chisels and other implements for cutting stone, are unsurpassed in hardness and durability by any metals of the present day.

The art of making copper tools, and giving them hardness equal to the finest steel, was known to them, but it has been lost in the destruction of those nations by the so called Christian Spaniards.

The civilization of the Montezumas and Incas was confined within the limits of the supply of copper and bronze. There was not enough of these metals obtained to allow their universal use by the masses, hence they remained in comparative ignorance and poverty.

The mechanical arts, so far as they could be developed by this limited supply, were confined to a class, and they, as usual in such cases, were under the control of the priests and rulers of their respective countries.

The nations of the Eastern continents had made much greater advances in the discoveries and uses of other metals than those of the Western. The art of reducing iron from its ores and working it into all kinds of shapes and forms for use gave a much wider field for the development of mechanical arts among the masses. Its great abundance and universal distribution, and the ease with which it could be wrought into useful forms, gave an impulse to mechanical industries, and manufactures which had been unknown to man before iron began to supplant copper, bronze, and brass implements. By a careful study of the early civilization of different races, in all parts of the world, we discover that such civilization was always limited by the supply of useful metals and their knowledge of working them into useful forms.

Those nations and races of men who have learned to mine and work useful metals have become powerful, have subdued their less fortunate neighbors, have collected the wealth of surrounding tribes, and made them tributary to their growth and power. The miners and metal workers in time became masters of the world, and in the higher sense they are masters of the world to-day. In brief, a careful reading of the history of civilization will show that those nations that learned to mine and work metals became civilized, wealthy, and powerful, while those races that never established mining industries and the manufacture of metallic articles have always been savages, and are savages to-day. The conclusion, therefore, is inevitable that mining, as an industry, is the oldest known to our race, and that it has been as it is now, the foundation of the whole structure of civilization, the chief element of progress, and basis upon which all other industries rest.

Extraordinary Specimen of American Sheet Iron.

There is now being shown in the Birmingham district an extraordinary specimen of iron-making in the United States. It is a portion of a sheet of very thin iron, so thin that though its surface dimensions are 4 in. by 3¼ in., yet its weight is only 3½ grs. apothecaries' weight. The breath of the nostrils will drive it away almost as if it were the cinder of burned paper. The thinness is itself very surprising, but the extraordinary part of the matter is that the iron has been made from what the Americans term a "muck bar," obtained from a Danks' puddling furnace at Pittsburgh without being reworked. Thus, an extreme thinness of iron, which it is almost impossible to secure from the very best materials, worked and reworked many times over in the usual way, has been got from the iron in the state of crudeness in which it was found upon leaving a mechanical puddling furnace. It is assumed in this country that the iron has been made from the ordinary district pigs, and the specimen is deemed to demonstrate the great value of machine puddling as practiced by the producers of the iron. And the specimen has an important commercial as well as a scientific significance. There is to the iron makers here the disagreeable inference that if crude iron can be worked to such foil as is described, then that sheets of greater thickness, but still of a thinness that brings them to the narrowest gauge embraced in the sheets generally made in this country, and which realize very high prices, should be produced by the United States iron masters at figures so much below those at which alone latens and button iron, for instance, can be made in this country, that the Americans must be in a position to successfully compete with the British iron master for those kinds even in his home market. Men in the trade who have seen the specimen are expressing the belief that the American should be able to compete with the English maker in the Antipodean-colonial, the Russian, and the Chinese markets, whither large consignments of British sheet-iron are constantly going.—(*London*) *Mining Journal.*

The Siren Fog Signal is described by Dr. Tyndall as beyond question the most powerful fog-signal which has hitherto been tried in England. The instrument is called a siren because the sound is produced by means of a disk, with twelve radial slits, being made to rotate in front of a fixed disk exactly similar. The moving disk revolves 2800 times a minute, and in each revolution there is, of course, 12 coincidences between the two disks; through the openings thus made steam or air at high pressure is allowed to pass, so that there are actually 12 times 2800 (or 33,600) puffs of steam or compressed air every minute. This causes a sound of very great power, which the cast iron trumpet, 20 feet in length, compresses to a certain extent; and the blast goes out as a sort of sound beam in the direction required. This siren was sent over to England by the American Light House Board, at the request of the Trinity Corporation, to be tried with other instruments in the recent experiments at South Foreland, and it has certainly beaten all the steam whistles, reed horns and guns that were tried with it. It was designed and manufactured by Mr. Brown, of Progress Works, New York. From a paper on the recent experiments to which we have referred, read on the 7th of May, by Vice Admiral Collinson, C. B., at the Royal United Service Institution, we learn that the Trinity House has already ordered a number of these instruments to be made with the view of establishing round the British coasts a complete chain of sound signals, to be used in foggy weather when light houses are of no avail. This siren can be heard in all sorts of weather at from two and a half to three miles, and in the Trinity House experiments was, on one favorable occasion, heard 16¾ miles at sea.

The extensive coal fields in the Island of Saghalien, which was recently ceded by Japan to Russia, are to be worked by Russian engineers and miners, and it is intended to employ a large number of the convicts from Siberia.

The construction of a gun weighing 100 tons has been begun by Sir William Armstrong, in England. This gun is to be a muzzle loader, 17 inch bore, and if successful will be the most powerful weapon ever constructed.

Naval armaments are still in a transition state. It is asserted in England that the moment an 81 ton gun is fairly afloat, in a ship built to carry it and use it, the fate of seagoing armor clad vessels of the present type is sealed.

The Valley Mill, at Youngstown, O., has an order for re-rolling 1000 tons of rails for the Atlantic and Great Western Railroad.

The Watson Bridge Works Burned.

On the morning of Tuesday the building of the Watson Manufacturing Works, at Paterson, New Jersey, was nearly destroyed by fire. The building in which the fire originated was of brick, 50x60 feet front, and four stories high, built in the most substantial manner. It had two three-story extensions, 44x120 feet, and 51x148 feet. The other buildings, being separated from these, were saved.

The fire broke out on the third floor, in the angle of one of the wings, a few minutes after the watchman had gone his rounds. Just before the fire, Charles Wildey, an employe, who was not on duty at the time, ascended by the elevator to the third story and remained there some time. He had no legitimate business there, and was not employed in that part of the works at any time. His strange action and previous bad reputation made him an immediate object of suspicion, and he was arrested. It required the utmost efforts of the police to prevent the workmen from lynching him. He has been suspected of arson before. He was locked up to await examination.

The Watson Manufacturing Company estimates its entire loss at from $130,000 to $140,000, including building, stock, and machinery. The total insurance was $120,000, distributed in a number of companies in sums of about $3000, of which about $70,000 is on the property destroyed. The works were run day and night with a force of 450 hands, about half of whom will be temporarily thrown out of employment.

The Watson Company has already made arrangements to rebuild the shops, and the work will be begun next week. The new buildings will only be two stories in hight. This is the second time the shops have been destroyed within two years. A large number of contracts were on hand, including the Portage bridge for the Erie Railway Company, a bridge for Fairmount Park, Philadelphia, a bridge for Newburyport, Mass., a contract for $40,000 worth of iron for the Equitable building in New York, the iron work for the Art Museum of New York, and the new sugar-house in Jersey City. The company does not anticipate any serious delay in completing these contracts, and believes that the Portage bridge will only be delayed two days beyond the contract time.

Iron Manufacture in California.

The San Francisco *Commercial Herald* says: Immense beds of iron, and generally of the most valuable kinds, exist at many points in California as well as in the adjacent State and Territories. The great obstacles to the production of that metal here have been the high prices of labor and the difficulty of obtaining a good fuel for smelting the ores; charcoal being too dear and none of the fossil coal yet found here answering well for that purpose. It is claimed that the Lincoln coal in Placer county, will serve this end, satisfactory trials having been made of it. If this really be the case, it is an important fact, as heavy beds of iron ore exist in the same neighborhood.

The consumption of iron on this coast is, for the population, enormous, almost the whole of it being imported. As charcoal produces a quality of iron greatly superior to the best of mineral coal, and we have timber in abundance for making it at most points where the ferruginous ores abound, the cost of that fuel will not be likely to delay much longer, efforts being made to commence the manufacture of iron at some of the more favorable localities in the State. Several enterprises of the kind are now talked of, and there is little doubt but some of them will soon take a practical shape, one having in fact already done so. A substantial company, composed mostly of New York capitalists, was formed last fall for the purpose of manufacturing this metal, the works to be located in the city of Sacramento, and run on ores obtained from Shasta county, the citizens of that place having contributed an eligible site for the smelting furnaces. The facility with which fuel can here be obtained, and the iron shipped to market, makes Sacramento a favorable locality for works of this kind.

Our annual importation of iron in its various forms ranges from 250 to 300,000 tons, bought at an average prime cost of more than $10,000,000; all of which, with the exception of about $50,000 paid for Oregon-made iron, goes out of the country. Through the growing demands for mining machinery, and the increasing use of this material in the construction of buildings, bridges, &c., the consumption of iron on this coast is being rapidly extended.

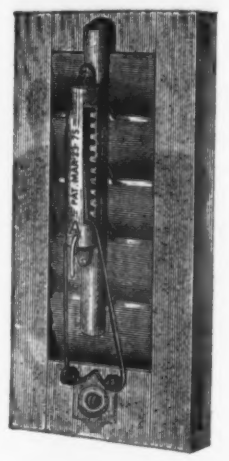
On every pound of imported iron we have to pay a tariff in the shape of freights and other charges equivalent to $15 or $20 per ton, a sum greatly in excess of what it would cost to make a first-class article of pig iron in this State. If we should do no more than supply the home demand for this description of iron, it would not only serve to retain vast sums of money in the State, but would give rise to new industries in the manufacture of stoves, castings for agricultural implements, hardware, &c., most of which, instead of importing for domestic use, we could supply to our immediate and more distant neighbors.

Being so strongly appealed to by considerations of economy, it is only reasonable to suppose that the extraordinary inducements existing here for the manufacture of iron will stimulate to greater diligence those already about to embark in the business, and lead to the early inauguration of many new enterprises of this kind.

In digging for coal at Wyandotte, Kansas, the workmen have struck a vein of gas which, in its escape, produces a roaring noise which may be heard a long distance. It is estimated that at least 250,000 cubic feet of inflammable gas escape from the aperture daily.

Jermain's Window Blind Slat Stop.

We illustrate herewith Jermain's Patent Window Blind Slat Stop, a very neat and effective contrivance for holding blind slats securely in



any desired position. They are made of brass, neatly finished, and are easily attached. J. Clark Wilson & Co., No. 81 Beekman street, are sole agents for these goods, which they offer to the trade at $1·50 per dozen, net; for large orders a concession from this figure would be made.

A French journal says that of the score of fire-proof compositions that have been brought forward within as many years past, there is scarcely one that possesses superior or even equal adaptation to the purpose, to the following: Dissolve, in cold water, as much pearlash as it is capable of holding in solution, and wash or daub with it all the boards, wainscoting, timber, etc.; then, diluting the same liquid with a little water, add to it such a portion of fine yellow clay as will make the mixture of the consistence of common paint, and then stir in a small quantity of paper hanger's flour paste to combine both the other substances. Give three coats of this mixture, and, when dry, apply the following composition: Put into a pot equal quantities of finely pulverized iron filings, brickdust and ashes, pour over them size or glue water, set the whole near a fire, and, when warm, stir them well together. With this liquid composition, or size, give one coat, and on its getting dry, give a second coat. It resists fire for five hours, and prevents the wood from ever bursting into flames; that is, it so resists the ravages of fire as, at most, only to be reduced to coals or embers, without spreading the conflagration by additional flames. It is found that a quantity equal to twenty pounds of finely sifted yellow clay, a pound and a half of flour for making paste, and one pound of pearlash is sufficient to prepare a square rood of deal boards.

Special Notices.

$80,000.

A manufacturing firm with a large investment in Tools and Machinery, desire to increase their capital by the above amount, with a general or special partner. The firm has met with no losses, is unembarrassed, and desires this capital to make their present machinery fully operative. Their machinery is all built by themselves, and with some additions to their present facilities they think they can control the market in goods of their line of manufacture. Running at a disadvantage of limited working capital, they made a margin of profit in 1874.

First-class reference given. Address

"MANUFACTURER,"

Office of *The Iron Age*, 10 Warren St., N. Y.

Important to Manufacturers.

BISSELL, WELLES & MILLET,
Auctioneers and Commission Merchants, No. 15 Murray St., New York,

Solicit from Manufacturers and others consignments of Hardware and Cutlery for our weekly Auction Sales to the Trade, or at private sale for cash, as desired. Our facilities for moving large lines of goods are unsurpassed. Advances made if desired.

An experienced Traveling Salesman in Hardware and Cutlery, intimately acquainted with the jobbing and retail houses throughout the Southern States in above lines, is open for engagement.

Address *HARDWARE, Box 5,*
Office of *The Iron Age*, 10 Warren St., N. Y.

Furnace Engineering,

Plans, Estimates and Superintendence FOR BUILDING OR REPAIRING.

Reliable Analyses Furnished, and Advice given concerning the Value of Materials, Best Mixtures & Methods of Working.

Special Attention paid to Investigating Cases of Unsatisfactory Results.

Furnace companies supplied with first-class men for all positions. Competent managers and founders desiring situations are requested to send full particulars. Correspondence solicited on all topics of interest in furnace work. Letters answered promptly without charge. Address,

EDWARD J. HALL Jr., Blast Furnace Engineer,
452 Franklin Street, BUFFALO, N. Y.

MANUFACTURERS

desirous of introducing their goods to the **British** and **Continental** Markets, are advised to insert advertisements in the newspaper **"IRON,"** published every Saturday, at *99 Cannon Street, London, E. C.*

SCALE: First 3 lines, 3/; every additional line, 10d. Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

Special Notices.

THE SIXTH
Cincinnati Industrial Exposition

Opens for the reception of goods **August 2, 1875.** Opens to the public **September 8th,** and continues open until **October 9th.**

16 GRAND DEPARTMENTS,

and an extended premium list in medals and gold coin.

Machinery Tested and Fully Reported upon.

Send for rules and premium list, and blank applications for space.

FRANK MILLWARD, Sec'y.

TENTH
Industrial Exhibition

UNDER THE AUSPICES OF THE

Mechanics' Institute,
Of SAN FRANCISCO.

Manufacturers, Mechanics, and others, are advised that the above Exhibition will be opened in San Francisco on the

17th day of August

next, and will continue open at least one month.

The Board of Managers invite all who desire to exhibit, to send in their application for space without delay to **Mr. J. H. CULVER,** Secretary, **27 Post St., San Francisco,** who will promptly answer all inquiries.

700,000 PERSONS

from all parts of the Pacific visited the Exhibition of 1874, to see what could be learned or purchased in San Francisco and the United States.

San Francisco, with its population of one quarter of one million, is in intimate relations with Japan, China, Australia, Mexico, Hawaian Islands, British Columbia, the various islands of the Pacific and contiguous domestic territory.

There is no charge of exhibiting, and power for driving machinery, etc., is furnished free.

By order of the Board of Managers.

A. S. HALLIDIE, Prest.

Briesen's Patent Agency

FOR SECURING INVENTIONS, TRADE MARKS, &c., IN AMERICA AND EUROPE,

No. 258 Broadway, New York.
A. V. BRIESEN.

TO LET,
A Light, Handsome Office.

Possession Immediately.

HERMANN BOKER & CO.,
101 Duane Street, N. Y.

REMOVAL.

We have Removed our office and stock of Cutlery to

107 Duane St.

PETERS BROTHERS.

WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address,

IRON AND STEEL,
Care of *P. O. Box 813, Bridgeport, Conn.*

DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of

Iron and Steel Drop Forgings

in quantities to order at reasonable rates.

HERMANN BOKER & CO, Proprietors, 101 & 103 Duane St., N. Y.

THE

McHaffie Direct Steel Castings Co.
STEEL CASTINGS,

Solid and Homogeneous, guaranteed to stand a Tensile Strain of 25 tons per square inch. An invaluable substitute for expensive **WROUGHT IRON FORGINGS** or for Iron Castings, where great strength is required. Office, cor. Evelina and Levant Sts., **PHILADELPHIA.**

Send for Circular and Price List.

Merchant Iron or Nails

Wanted in exchange for 300 tons No. 1 Wrought Scrap Iron.

GILCHRIST & GRIFFITH,
Mount Pleasant, Iowa.

A. PURVES & SON,
Corner South & Penn Streets, Phila.,
Dealers in
Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Babbit Metals, Foundry Facings. Best Quality Ingot Brass.
Cash paid for allkinds of **Metals** and **Tools.**

For Sale, &c.

For Sale.

Rolling Mill MACHINERY

The undersigned offer the following machinery For Sale:

One Upright Engine 14x14, single crank, (1) one ton fly wheel, governor, valves, and steam pipe complete.

One Upright Engine 18x20, for double crank, (8) eight ton fly wheel, governor, valves and steam pipe complete.

One Horizontal Engine 16x36, (15) fifteen ton fly wheel, governor, valves and steam pipe complete.

One Train, (18) eighteen in. rolls, with housings, bed plates, couplings, &c., complete; with one extra pair each of 18 inch springs and roughing rolls, and one bull head shears attached to train.

One Train, (10) ten in. rolls, (3 High, with bed plates, housings, couplings, &c., complete; with 2 sets extra (3) three high roughing rolls 30 in. long, 1 set extra 24 in. long, 1 set cutting rolls 24 in. long, and 18 rolls finished for all kinds mill works; cramp bars, roll plates, guide boxes and guides complete.

Two 13 in. Flue Boilers, 42 in. diam., 44 ft. long.

Two 18 in. Flue Boilers, 42 in. diam., 40 ft. long.

One 13 in. Flue Boiler, 42 in. diam., 30 ft. long, all with steam pipes and valves complete.

Also, One Horizontal Tubular Boiler, 42 in. diam., 7½ ft. long; 40, 3 in. tubes with engine, governor, valves, crank, steam pipe, and all fixtures complete.

One Wrought Iron Smoke Stack, 48 in. diam. by 75 ft. long.

One 3500 lb. Steam Hammer, made by Bement & Son.

One 1600 lb. Steam Hammer, made by Bement & Son.

One 600 lb Steam Hammer, made by Bement & Son.

One 400 lb. Steam Hammer, made by Bement & Doughty.

One Single Box Shears.

One Double Box Shears.

One Small Upright Shears.

One Large Ivison & Brooks Shears, made by the American Saw Co.

One 18 ft. and 4 small straighter ing plates.

One 22 in. Planer complete, and 2 Turning Lathes.

One each, No. 5 and 6 Double action Duplex Pumps.

One each, No. 2 and 3 Single action Duplex Pumps.

One Upright Power Duplex Pump, together with mill, furnace and smiths' tools, tongs, &c., floor plates, belting, shafting, pulleys, and steam pipe, molds, dies, &c., all in good order and ready for use.

☞ We are ready to receive offers for the whole lot or any part of same. For full particulars, inquire of, or address,

RICHARDSON, BOYNTON & CO.,
232 & 234 Water St., N. Y.

FINER CHANCE SELDOM OFFERS.

For Sale, the stock and fixtures of a Retail Hardware House, business successfully conducted since 1860. Located in a thriving town of 10,000 inhabitants. Stock embraces Builders' Hardware, Agricultural Tools and Machines, Stoves and Tinware. Tin Shop in connection. The senior partner having deceased, the surviving partner will sell the entire interest to engage in other pursuits.

Address, *BOWERS & JENKS,*
May 31, 1875. *Milford, Mass.,*

For Sale.

Car Shop in Conshohocken, Pa., 50x100 ft. fronting on P. and R. R. R., with blacksmith shop 20x30 ft., engine house 15x30, 25 horse engine, and all the modern machinery necessary. The lot is 135x300 ft. For particulars call on or address,

HUTCHINSON & HAGAN,
Norristown, Pa.

INDIANAPOLIS.

The Best Retail Hardware Stand

in the State of Indiana For Sale, **FOR 30 DAYS ONLY.** $30,000 capital required. Sales now running from $400 to $600 per day. The very best reasons given for wanting to sell, which have no relation with the business. Such an opportunity for safe and profitable investment is rarely ever offered.

R. S. DORSEY, Broker,
8 Bates Block.

SPECIAL NOTICE.

I have three patents for Dies, Machinery, and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1865; January 31, 1866, and July 3, 1866. **There is a special claim on each of the Dies.** All persons infringing on said patents will be held responsible to the extent of the law. **Russell Jennings.**

DEEP RIVER, Conn., Sept. 7, 1874.

DISCOUNT LISTS.

Iron Screws, Revised Lists, 13 Discounts, 75c. each.
Files & Bolts, } Bolts, Revised and Old Lists, } $1 each
} Files, 5/50 to 9/50 to the £ sterl. }
Address, with cash, (Copyrighted).
Dayton & Lamberson, 97 Chambers St., N. Y.

Charcoal Blast Furnaces.

Having during the past 10 years constructed and put in operation a number of the most successful Charcoal Blast Furnaces in the country, and having a competent corps of workmen constantly in my employ, I am enabled to offer advantages in constructing or remodeling upon the latest and most approved plans.

Examinations of Furnace Property made and reported upon when solicited. Correspondence promptly attended to.

J. M. WHITE, Engineer,
93 W. Alexander St., Rochester, N. Y.

For Sale, &c.

Iron Ore & Mineral Lands,

Thirty thousand acres, abounding in the several varieties of Hematite and Magnetic ores, covered with timber; limestone abundant; contiguous to one of the largest Railroads leading east and west, low freights insured; coal within 20 miles of Works. Consists of Charcoal Furnace and Forge of 200 tons a month capacity; fine manager's house, large store, stables and workmen's houses, &c. Labor 75c. a day; cost of Charcoal, 5c. a bushel; iron ore, $1·75 a ton: lime stone, 80c., all delivered at Furnace. Freight to Pittsburgh, $3·60, Baltimore, $2·40. Ores can be placed in Pittsburgh almost beyond competition. For sale, or will be operated jointly.

Address, *P. O. Box 863, Baltimore, Md.*

For Sale!
Hardware Business

In a growing manufacturing town, one of the best locations in Vermont. Business well established and profitable. Stock about $10,000, in good order. This affords an excellent opportunity for a party with small capital to secure a paying business.

Address, **W. B. BIXBY & SON,**
Vergennes, Vt.

For Sale.

A first-class Hardware Business, located in the thriving city of Bloomington Ills. Above business has been established for over twenty (20) years, and presents to any one desirous of doing an "A No. 1" retail and jobbing trade a most favorable opportunity. Amount of stock about $15,000. Will be sold at a sacrifice. Ample reasons given for selling. For further information, address,

GEO. BROADNER, Bloomington, Ills.

FOR SALE.

An ¾ inch mill train for making Merchant, Band and Hoop Iron. Will be sold cheap.

Apply to **W. W. JONES,**
Near the Lehigh Valley Railroad Depot,
Allentown, Pa.

To Stove Manufacturers and Foundrymen.

The Carbon Stove Company,
Of Burlington, N. J.,

Will sell their Foundry, with all its appurtenances, business and good will, upon very liberal and accommodating terms, offering to any party wishing to engage in the Stove or general Foundry Business a rare opportunity.

The Foundry Buildings, which are of a capacity to employ forty or more molders, are very conveniently located upon navigable tide water on one side, and the Pennsylvania Railroad, with its freight station in front, being on the direct line between New York and Philadelphia.

The Buildings, Machinery and Appliances are all in prime order, and the assortment of Patterns, &c., for Stove, Range or Heater work, unsurpassed.

Address, for terms or other particulars,
CARBON STOVE CO., Burlington, N. J.

FOR SALE CHEAP.

Two Steam Hammers, 200 lbs. each, made by Ferris & Miles and Marchand & Morgan, but little used; have treadle attachments, and are in perfect working order. Also 700 to 800 lb. drop hammer, with shear attachment, board lifter, a valuable tool, all in perfect working order.

A. D. HALL, 158 Ashland Ave.
Chicago, Ills.

For Sale, Hardware Business

In successful operation since 1845. Rare opportunity to secure an old and established business. Stock of General Hardware, Iron, Nails, &c., &., will invoice $6000 to $8000. Two story brick business room, 25x90, with cellar under all, for $300. After first payment will make such terms as will be easy, and cannot fail to suit purchaser. Will assist purchaser at starting, if necessary. Satisfactory reasons for selling will be given.

Address, **C. U. RAYMOND,**
Cambridge City, Wayne Co., Ind.

A **BLAST FURNACE FOR SALE** at Napanoch, Ulster Co., State of New York, on the Delaware and Hudson Canal, with extra facilities, and a capacity of 20 tons per day Anthracite or 15 tons of Charcoal, together with a splendid water-power, goes with the furnace. The furnace is in good order and could be put in blast in a short time. Will be sold very low on accommodating terms. Charcoal can be had for many years.

Address, **H. RANGE,**
94 Gold Street, New York City.

FOR SALE.

At Lowest Manufacturers' Rates.

GUNS & SHEET ZINC,

Best German and Belgian Brands,

By *LOUIS WINDMULLER & ROELKER,*
20 Reade Street, N. Y.

For Sale,
Stove and Tin Business.

Will sell, on good terms, one of the best arranged House Furnishing Stores in Canada West, at St. Thomas. The premises are roomy, the buildings having been arranged especially for this trade, with Tinsmith's workshops and benches complete for 12 men.

Present Stock about $6000.

St. Thomas is the head quarters of the Canadian Southern Railway Co. To a practical, energetic man this offers unusual advantages. Business well established and with good connection. Reason for disposal, present proprietors increasing their wholesale and retail Hardware Store next door to the above premises. Address

HORSMAN & HORSMAN,
Iron and Hardware Merchants,
St. Thomas, Canada West.

FOR SALE,

at 10c. a copy, general *Spanish Weekly Market Review*, written and published by the subscriber. 1 July, 1875, number 156, circulating in Mexico, the West Indies, Central and South America, including Brazil, Spain and Manila, on which certain standard articles of American manufacture are quoted. *Specimen Copies sent free.* The undersigned is also

Translator for Manufacturers and Land Companies,

from and into the
ENGLISH,
SPANISH,
FRENCH,
and GERMAN.

Spanish Catalogues got up correctly and with despatch. Address, **C. KIRCHHOFF,**
Metal Reporter of "The Iron Age,"
Box 3091, N. Y.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, June 30, 1875.

During the past week there has been a decided improvement in the outlook for general business, and an advance in the prices of securities. The money market continues very easy, with rates to borrowers on call 2 @ 2½ per cent. Good commercial paper is quotable at 3½ @ 5 per cent.

During the week gold has been firm but quiet. On Thursday the Treasury sold $500,000 at 117·09 @ 118·15. The following table shows the daily range of the premium :

	Highest.	Lowest.
Thursday	117¼	117¼
Friday	117⅜	117⅛
Saturday	117¼	117⅛
Monday	117⅜	117
Tuesday	117¼	117¼
Wednesday	117¼	116⅞

Government bonds were strong, both here and in London. On Saturday last a call was issued by the Treasury for $5,000,000 of five-twenties, interest to cease September 25. This call was issued at the suggestion of the Syndicate, who had been sold that amount of new fives in Europe. Railroad bonds are strong, notably those of the Pacific Railroads. We give below the closing quotations of Governments.

The stock market has been strong throughout, and prices have tended steadily upward. The principal dealings have been in Pacific Mail, Lake Shore, Western Union Telegraph, Erie, Northwestern, Union Pacific, and St. Paul. We give below the highest and lowest of to-day's quotations of active shares :

The bank statement shows a loss of $2,806,300 in specie, and a gain of $2,591,300 in legal tenders, making a decrease in total reserve of $215,000. The surplus reserve is $639,975 lower than last week, the banks now holding $21,306,500 more lawful money than their liabilities under the law require. The following is a comparison of the averages for the past two weeks :

	June 19.	June 26.	Differences.
Loans	$275,217,500	$276,707,800	Inc. $1,490,300
Specie	11,653,300	8,847,000	Dec. 2,806,300
Leg. tend	68,900,200	71,491,500	Inc. 2,591,300
Deposits	234,068 100	235,768,000	Inc. 1,699,900
Circulation	19,142,000	19,016,500	Dec. 125,500

The foreign trade movements for the week are given as follows :

IMPORTS.

	1873.	1874.	1875.
Total for week	$8,447,831	$6,646,571	$6,934,666
Prev. reported	204,655,775	204,507,010	168,812,667
Since Jan. 1	$213,103,606	$211,153,581	$175,747,333

Among the imports of general merchandise were articles valued as follows :

	Quant.	Value.
Brass goods	3	$50
Bronzes	13	2,503
Chains and anchors	33	1,295
Copper		113
Cutlery	62	22,994
Gas fixtures	1	1,113
Guns	40	9,783
Hardware	56	5,810
Iron, pig, tons	1,127	29,860
Iron, cotton ties	826	2,454
Iron, other, tons	4o3	21,195
Railroad bars	574	8,020
Metal goods	160	20,845
Nails	3	304
Needles	10	5,858
Old metal		3.518
Platina	2	8,015
Per. caps	14	2,460
Saddlery	6	1,399
Steel	914	18,207
Spelter	296,523	17,442
Silverware	1	140
Tin, boxes	8,162	61.317
Tin, 3832 slabs	418,972	78,854
Wire	764	8,736
Zinc	99,376	6,224

EXPORTS, EXCLUSIVE OF SPECIE.

	1873.	1874.	1875.
For the week	$5,568,641	$7,191,644	$5,218,653
Prev. reported	134,640,920	137,789,033	144,980,677
Since Jan. 1	$140,209,601	$144,980,677	$150,199,330

EXPORTS OF SPECIE.

Total for the week	$1,901,918
Previously reported	48,803,782
Total since January 1, 1875	$50,705,700
Same time in 1874	27,676,413
Same time in 1873	26,971,214
Same time in 1872	33,436,823

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. Currency 6's	122¾	122¾
U. S. 6s 1881, reg	121	121¾
U. S. 6s. 1881, cou	126¼	126½
U. S. 1864, 5-20 reg	118	—
U. S. 5-20 1862, cou	118¾	118¾
U. S. 5-20 1864, reg	118¾	119
U. S. 5-20 1864, con	118¾	119
U. S. 5-20 1865, reg	120¾	121½
U. S. 5-20 1865, cou	122¼	122½
U. S. 5-20 1865, reg. new	120¾	120¾
U. S. 5-20 1865, cou	123¾	124
U. S. 5-20 1867, reg	121¾	121¾
U. S. 5-20 1867, cou	125¾	126½
U. S. 5-20 1868, reg	121¼	121¾
U. S. 5-20 1868, cou	125	125¼
U. S. 10-40 reg	117¾	118
U. S. 10-40 cou	119¾	119¾
U. S. 5s, 1881, reg	117¾	117⅞
U. S. 5s, 1881, cou	118¼	118¼

The following were the highest and lowest prices of stocks to-day :

	Bid.	Asked.
N. Y. Cen. & Hudson Consolidated	103¼	103⅛
Lake Shore	62¾	61¼
Rock Island	104	103¾
New Jersey Central	113¼	113¾
Michigan Central	69½	69¾
Cleveland & Pittsburgh	91½	91¾
Illinois Central	103¼	103¾
Wabash	5½	5¾
Harlem	131	131
Western Union Telegraph	79¼	78
Atlantic and Pacific Telegraph	23¼	22½
Northwestern	40¾	39½
" Pref	51¾	50¾
Milwaukee & St. Paul	33¾	33¼
Pacific Mail	41¾	39¾
Erie	14¾	13¾
Ohio & Mississippi	23½	23¾
Union Pacific	76¾	75
Missouri Pacific	50¾	50⅝
Atlantic & Pacific Preferred	15	15
Am. Mer. Union Express	59	59

GENERAL HARDWARE.

The demand for Hardware of every description is, as is usual in midsummer, confined within the limits of the actual present necessities of the trade, and general dullness prevails. We hear of some changes in lists, which will not be completed for a few days. In Foreign Hardware there are no changes to note. The demand for Nails continues in about the same condition noticed for several weeks. We continue to quote 10d. in lots of 200 kegs and over, $3·25 net ; for smaller lots, $3·30 @ $3·40 is the general asking price, according to quantity.

Sargent & Co. have removed from No. 70 Beekman street, where they have been for ten or twelve years, to No 37 Chambers street, where they occupy a building running through to Reade, which, with the steam elevator and other conveniences introduced, will give them ample facilities for handling the large quantity of goods which pass through their hands.

The Lock makers have adopted new lists and discounts, changing almost all their prices. This action was taken yesterday (Tuesday), and the only list we have been able so far to obtain is that of the Russell & Erwin Mfg. Co., which we give below. They quote from this list a discount of 40 per cent., and 2 per cent. for cash. It will be observed that the list on Padlocks has also been changed.

PRICE LIST OF RUSSELL & ERWIN MFG. CO.

No. of lock.	Page of 1874 list.	Per doz.
Locks.		
0	89	$5·50
0½	89	7·00
00½ New		7·50
0¾ New		9·50
0½	89	6·50
0⅝	89	8·00
00½ New		8·50
0¾	89	10·50
00¾ New		10·50
1	89	10·50
01 New		10·50
1½	89	12·50
01½ New		12·50
01¾ New		11·50
02 New		13·50
6½	96	30 00
7½	96	28·00
8	97	20·00
8½	97	17·00
9	100	6 75
9½	100	4·75
10	100	3 75
11	100	6·25
Refrig'tor K'bs.		
400	100	2·00
300	100	2·75
100	100	6·50
12	92	12·50
13	92	14·50
013	78	14·50
013, 2 keys	78	17·00
013¾	85	27·00
13½	92	17·50
013½	78	17·50
013½, 2 keys	78	20·00
13¾	92	20·50
013¾	78	20·50
013¾, 2 keys	78	23·00
14	93	18·00
014	80	19·00
18	93	26·00
018	80	27·00
018, 2 keys	80	29·50
019	85	27 00
22	124	4·00
23	91	9·50
25¼	101	32·00
25½	101	30·00
27	101	22·50
28	127	7 00
29	127	8·25
30	127	15·00
31	111	10·00
31¼	111	16 00
31½ C'pl'e	111	38·00
	Per set.	
32 B	109	18·00
32 EP	109	23·00
32 HP	109	44 60
33 B	109	19 50
33 EP	109	24 50
33 HP	109	47·00
032 B New		7·50
032 EP New		12·50
032 HP New		33 50
032½ B New		6·00
032½ E P New		9·50
032½ HP New		24·00
033 B New		9·00
032 EP New		14·00
033 HP New		36·50
	Per dozen.	
34	110	25·00
35	110	27·00
36	110	21·00
37	110	67·00
38	126	12·50
38½	126	9 50
39	126	9 50
40	124	2·00
42	124	4 50
42½	124	5·75
44½	125	9·00
44¾	125	9·00
45	129	13·50
46	129	22·50
46½	127	30·00
47	129	15 00
48	126	8 00
50	128	9 50
52	128	16·00
53	128	9·50
54	98	16·50
55	98	19·00
57	104	30·00
057	103	30·00
58	104	18·00
59	130	4·00
60	124	2·50
61	124	3·75
62	123	7·50
63	123	8·75
64	123	9·50
65	123	10·75
T Handles.		
Japanned	123	·75
Tinned	123	1·25
Brass	124	2·50
Silver Pl'd	123	3·50
67	130	Each.
Brass	130	7·50
Bronzed	130	10·00
Elect. Pl'd	130	10·00
Hand Pl'd	130	14·00
Lock.		**Per doz.**
71	112	5·75
72	112	4·50
072	114	4·50
73	112	8·75
073	114	8·75
073, 2 keys	114	11·25
74	112	4·00
76	113	12·50
77	113	11·25
78	113	14·75
79	113	14·25
80	113	4·75
81	113	5 75
84	164	16·00
85	165	30·00
85 MK	165	32·00
85 Porc'l'n	165	36·00
86	122	5·75
87	122	7·00
88	122	7·75
89	122	9·00
Thumb Knobs.		
Brass	122	2·50
Plated	122	3·50
Mineral	122	2·00
Porc. Jap'd	122	2·50
" Pl'd	122	5·00
" Porc	123	5·00
92	117	22·00
93	99	6·00
With Knobs and Escutcheons.		
1500	99	8·25
93	"	
With Knobs and Escutcheons.		
1300	99	9·00

No. of lock.	Page of 1874 list.	Per doz.
With Knobs and Escutcheons.		
1100	99	16·00
500	99	7·25
300	99	8·00
100	99	12·75
96	131	2·50
96½	131	2·50
With Knobs.		
1500	131	4·75
1300	131	5·50
1100	131	10·50
500	131	3 75
300	131	4·50
100	131	8·25
Locks.		
100	134	52·00
100½	124	48·00
01	138	81·00
103	142	56·00
104	145	56·00
105	135	34·00
105½	135	34·00
110	158	64·00
115	159	44·00
122	148	96·00
131	162	99·00
132	162	111·00
140	139	50·00
140½	151	53·00
142	149	60·00
143	143	36·00
150	153	75·00
154	155	80·00
161	163	62·00
162	163	72·00
0172	87	80·00
173	83	35·00
0173	83	70·00
174	83	80·00
175	107	62·00
0175	107	82·00
180 New		44·00
180½ New		30·00
181 New		48·00
181½ New		34·00
182 New		46·00
182½ New		32·00
183 New		50·00
183½ New		36·00
184 New		48·00
184½ New		34·00
185 New		52·00
185½ New		38·00
186 New		56·00
199	43	36·00
200	43	31·00
250½ New		5·75
251½ New		7·25
252	47	37·00
253	49	47·00
255 New		7·00
256 New		8·50
260	22	8·50
260½	22	10·50
261	22	10·50
261½	22	12·50
262	23	10·00
263	23	12·00
264	23	12·00
265	23	14·00
270	22	12·50
271	22	14·50
272	23	15·50
273	23	17·50
285	22	15·50
286	22	17·50
300	90	6·00
0300 New		6·00
301	90	7·50
0301 New		8·00
302	90	10·00
0302 New		10 00
303	90	11·00
0303 New		11·00
304	90	13·00
0304 New		13·00
310	90	7·00
0310 New		7·00
311	90	8·50
0311 New		9 00
312	90	11·00
0312 New		11·00
313	90	12·00
0313 New		12.00
314	90	14·00
0314 New		14·00
315	90	17·00
316	90	20·00
0321 New		10·00
0322 New		12·00
0323 New		13·00
0324 New		15·00
340	76	8·50
341	76	9·50
343	76	10·50
344	76	12·50
350	76	6·50
351	76	10·50
353	76	11·50
354	76	13·50
355	77	17·00
418	51	38·00
419	51	44·00
420	51	58·00
421	53	28·00
436	64	21·00
437	64	23·00
438	64	15·00
439	64	17·00
460	74	15·00
461	74	12·00
470	69	44·00
471	69	30·00
472	69	27·00
473	69	24·00
474	69	24·00
475	69	21·00
479	65	25·00
480	67	24·00
481	67	27·00
482	67	30·00
490	71	48·00
495	73	50·00
504	10	5 25
504½	11	6·75
508	10	6·75
508½	11	8·25
509	12	11·50
512	10	8·75
512½	11	11·50
513	13	11·00
514	13	14·50
531	14	17·50
532	14	22·00
535	14	14·50
537	14	14·50
537½	14	15·00
537¾	14	17·00
538	16	8 50
539	17	5·00
Half Knobs.		
500 Jap'd	17	2·00
500 Tin'd	17	2·75
300 Jap'd	17	2·50
300 Tin'd	17	3·75
100	17	5·00
101	17	5·00

No of lock.	Page of 1874 list.	Per doz.
Locks.		
543	15	20·00
544	21	17·00
541½	21	15·00
545	21	21·00
545½	21	18·00
546	21	24·00
546½	21	20·00
548	27	14·00
548½	27	12·00
548¾	27	8·00
550	34	3·50
550½	34	4·75
551	86	4·00
551½	36	5·25
552	36	5·00
552½	36	6·25
557	36	3·75
570	26	12·50
571	26	14 50
572	26	17·50
587	20	20·00
588	20	27·00
599	35	5·00
599½	35	6·25
603	28	10·25
604	28	3·75
605	28	5·00
606	29	4·50
607	29	5·75
607½	29	9·75
608	29	7·00
608½	29	11·00
612	29	6·50
612½	29	5·00
613	29	8·00
613½	29	6·50
614	29	10·00
611½	21	8·50
615	29	12·00
615½	29	10·50
6 4	29	14·00
623	29	16·00
629	32	3·75
630	32	5·50
630½	32	4 25
631	32	6·25
632	32	8 00
650	33	4·25
651	33	5·50
652	33	3·00
653	33	4·25
655	33	10·25
661	37	10·00
661½	37	10·00
662	37	16·00
665	39	25·00
665½	39	2·00
666	40	40·00
6 6½	40	45·00
Bowl Escutcheons.		**Each**
80	40	1·00
81	40	1·65
82	40	2·22
Locks.		**Per doz**
670	41	13·00
671	41	20·00
672	41	22·50
675 New		27·00
677 New		29·00
678 New		32·00
685	119	39 00
694	95	50·00
695	95	57·00
710	89	12 50
711	89	10·50
712	79	13 00
712, 2 keys	79	15·50
713	79	15 00
713, 2 keys	79	17·50
713¼	79	18·00
713½, 2 keys	79	20·50
713¾	79	21·00
713¾, 2 keys	79	23·50
718	81	27·00
718, 2 keys	81	29·50
720	89	13·50
725	102	40·00
778	115	18·00
778, 2 keys	115	20·50
781	115	6·75
790	116	44·00
790½	120	54·00
790¾	121	60·00
791	117	60·00
800	2	6·00
801	2	7 50
802	2	9·50
805	2	9·00

No. of lock.	Page of 1874 list.	Per doz.
806	2	10·50
807	2	12·50
810	4	13·50
811	4	15·50
812	4	18 50
813	4	26·50
820	3	7·50
821	3	9·00
822	3	12 25
825	3	10·50
826	3	12 00
827	3	15·25
830	5	15·00
831	5	17·00
832	5	21·25
833	5	29·25
850	6	5·25
850½ New		5·50
851	6	6·75
851½ New		7·00
8·5	6	6·75
856	6	8·25
860	1	5·50
860½ New		5·75
861	1	7 00
861½ New		7·25
862	1	9·00
862½ New		9 25
870	7	5·50
871	7	7·00
872	7	9·00
1199	45	28·00
1200	45	33·00
1250	45	39·00
1251	45	45·00
1260	22	7·50
1260½	22	9 50
1261	22	9·00
1261½	22	11·00
1270	25	12·50
1271	25	14·50
1272	25	15·50
1273	25	17·50
1400	55	66·00
1401	55	70·00
1402	55	46·00
1403	55	40·00
1404	55	48·00
1405	55	58·00
1407	55	51·00
1430	59	47·00
1431	59	57·00
1432	59	38·00
1440	59	35·00
1580	18	18·00
1583	18	13·50
1587	19	21·00
1587, 2 keys	19	24·00
1605	30	5·25
1607	30	6·25
1610	31	13 50
1610, 2 keys	31	16·50
1612	31	15·50
1612, 2 keys	31	18·50
1624	61	28·00
1625	61	31·00
1627	63	23·00
1627½	63	26·00
1661	38	12·00
1870	8	8·00
1871	8	10·00
1872	9	15·50
1873	9	17·50
1880 New		9·50
1881 New		12·75
1882 New		17 00
1883 New		20·25
2400	57	64·00
2401	57	74·00
2402	57	50·00
2403	57	44·00
2404	57	52·00
2405	57	62·00
2407	57	55·00
2430	59	51 00
2431	59	61·00
2432	59	42·00
2436	65	24·00
2437	65	27·00
2438	65	18·00
2439	65	21·00
2456	72	22·00
2457	72	28·00
2470	70	48·00
2471	70	40 00
2480	68	28 00
2481	68	31·00
2482	68	34·00
2612	30	7·50
2661	38	13·00

Brass Keys.—Pages 170 *to* 178.

Class No.	Per dozen.	Class No.	Per dozen.	Class No.	Per dozen.
1	$1 25	50	$2·50	79	$1·50
1¼	1·25	51	1·50	80	1·50
2	1·2	52	4·50	80½	1·50
2	1·25	53	3·50	81	2·00
3	1·50	54	2 00	81¼	2·00
4	2·00	54½	2·0	81½	2 00
5	3·00	55	4·50	82	2·00
6	3·00	56	4·50	84	1·50
7	1·50	57	2·50	85	1·50
8	1·25	58	4·53	86	1·75
9	1·25	59	4·50	88	1·50
10	1·50	60	4·50	89	1·50
11	1·50	61	4·50	90	1·75
12	1·50	62	3·00	91	4·00
13	2 00	66	3·50	92	1·75
14	2·00	67	4·50	93	2·25
15	2·25	68	4·50	94	2·25
16	1·25	69	4·50	95	4·50
17	1·25	70	2·00	96	4·50
18	2·50	71	1·50	97	4 50
19	2·50	72	1·50	98	4·50
21	2 50	73	2·00	150	1·50
22	2 50	73	2·00	151	1·50
23	3·00	74	2·00	152	1·50
24	2·50	75	1·50	153	1 50
49	1·50	76	2·50		
49½	1·50	77	2·50		

Tinned Iron Keys.—Page 178.

Class No.	Per dozen.	Class No.	Per dozen.	Class. No.	Per dozen.
120	$0·60	123	$0·60	130	$0·60
121	·60	125	·60	131	·60
122	·60	129	·60	136	·60

Small Malleable Iron Keys, Tinned—Page 178.

Class.	Per doz	Class.	Per doz	Class.	Per doz.
160	$0·60	163	$0·60	165	$0·60
161	·60	164	·60	166	·60
162	·60				

Parker's Patent Steel Keys, Nickel Plated.—Pages 182 *and* 183.

Class.	Per doz.	Class.	Per doz.	Class.	Per doz.
398	$3·00	407½	$2·50	426	$3·00
399	3·00	408	2·50	427	2·75
400	3·00	408½	2·50	450	7·00
401	3·00	409	2·5	451	7·00
402	4·00	409½	2·50	452	7·00
402½	4 00	410	4·00	453	7·00
403	4·00	410½	4·0	454	7·00
404	2·50	411	5·00	454½	7·00
405	2 50	412		455	7·00
405½	2·50	420		456	7·00
406	2·50	421	3·00	457	7·00
406½	2·50	422	3·00	458	7·00
407	2·50	425	2·75		

Metal Plate Escutcheons.

Silver Plated.

No.	1	2	3	4	
Silver Plated	$1·00	1·00	1·00	1·00	per single doz.
No.		5	6	7	
Silver Plated		$1·00	1·00	4·50	per single doz.
No.	8	9	11	85	
Silver Plated	$5·00	6·00	6·75	4·50	per single doz.
No.		15	16	17	
Silver Plated		$1·12	1·50	3·50	per single doz.
No.	18	103	104	107	
Silver Plated	$3·50	1·00	1·00	4·50	per single doz.
No.		116	119	150	
Silver Plated		$1·50	3·50	7·00	per single doz.

Porcelain Escutcheons.—Page 191.

Nos.	Per single dozen.	Nos.	Per single dozen.	Night Keys. Nos.	Per doz.
1	$0·80	13	$1·50	4	$1·25
2	·80	14	7·50	6	1·25
3	·80	100	7·50	7	1·25
4	·80	101	·80	116	1·25
8	1·25	102	7·50		
9	1·50	103	·80		
10	2·50	108	1·25		
11	1·75				

Metal Drop Escutcheons.—Pages 186 *and* 187.

	Per Single Dozen.																							
	No. 40		No. 41		No. 42		No. 43		No. 60		No. 61		No. 62		No. 100		No. 141		No. 177		Per Single Dozen.			
Hand Plated	19·00		19·00		19·00		$2·75		$0·75		$1·12		$		$		$		$		Japanned	$	No. 20	No.
Electro Plated	6·00		6·00		6·00		$2·75		$0·75		$1·12		$		$		$		$		Japanned	$	No. 21	No.
Brass	5·00		5·00		5·00		$2·75		$0·75		$1·12		$		$		$		$		Japanned	$	No. 22	No.
Japanned	$2·75		$2·75		$2·75		$2·75		$0·75		$1·12		$		$		$		$		Japanned	$	No. 23	No.
	40		41		42		43		60		61		62		100		141		177					
Hand Plated	19·00		19·00		23·00		32·00		8·25		9·00		12·00		12·00		18·00		20·00		Hand Plated	4·00	No. 26	No.
Electro Plated	6·00		6·00		8·50		14·00		4·75		5·50		6·25		6·25		10·00		6·00		Silver Plated	4·00	No. 27	No.
Brass	5·00		5·00		5·50		8·50		2·75		3·50		5·50		5·50		6·75		5·00		Silver Plated	4·00	No. 28	No.
Japanned	$2·75		$2·75		$2·75		$2·75		$0·75		$1·12		$		$		$2·69		$2·62		Silver Plated	4·50	No. 29	No.
	40		41		42		43		60		61½		62		100		102		141		Hand Plated	4·00	No. 26	No.
Hand Plated	19·00		19·00		23·00		32·00		8·25		9·00		12·00		12·00		18·00		20·00		Hand Plated	4·00	No. 26	No.
Electro Plated	6·00		6·00		8·50		14·00		4·75		5·50		6·25		6·25		10·00		6·00		Hand Plated	4·50	No. 28	No.
Brass	5·00		5·00		5·50		8·50		2·75		3·50		5·50		5·50		6·75		5·00		Japanned	$1·15	No. 30	No.
Japanned	$2·75		$2·75		$2·75		$2·75		$0·75		$1·12		$		$		$2·69		$2·62		Silver Plated	$1·50	No. 31	No.
	40		41		42		43		60		61½		62		100		102		141		Silver Plated	$1·50	No. 32	No.
Hand Plated	19·00		19·00		23·00		32·00		8·25		9·00		12·00		12·00		18·00		20·00		Hand Plated	5·50	No. 30	No.
Electro Plated	6·00		6·00		8·50		14·00		4·75		5·50		6·25		6·25		10·00		6

tons, making a supply of, together, 2383 tons, while there were delivered to consumption during the six months 2113 tons, leaving a stock of 270 tons to-day. Of Common English, New York alone had a stock of 25 tons on January 1, imported 325, delivered to consumption 325, leaving us with a stock of 25 tons to-day. We commenced the year with a stock of 10 tons English Refined, imported 95 tons, and consumed the entire supply. Of Banca, Per., and Austral we had no stock January 1, imported altogether 97 tons, and remain with a stock on hand of Austral of 66 tons. In other words, the total stock on January 1 was 635 tons, the imports 2300, making the supply 2935, out of which there were handed over to consumption 2574, leaving a stock of but 361 tons. This statement is a highly satisfactory one, when we consider the fearfully dull times we have passed through, and encourages the hope that the ensuing six months will show even larger deliveries. The difficulty which Tin encounters in the midst of large deliveries, both in Europe and this country, is the dread of Australian production, till we shall be able to form a better judgment on this subject. By telegraph from Europe we have the quotation of £83 for Straits, and from Singapore it was wired $22·25 per picul on the 26th inst. Tin Plates are quiet, but firm, as follows: Charcoal Bright, per box, gold, in large lots, ordinary brands, $8·25 @ $8·50; ditto Terne, $7·50 @ $7·75; Coke, $6·75 @ $7; ditto Terne, $6·75 @ $7; all gold.

Lead.—The large sale which we reported a week ago took place on account of the cheap figure at which the Lead was obtained, and having passed into the hands of large consumers, the entire market has been placed on a remarkably sound footing; not that we expect a high ruling henceforward. There will be plenty of Lead after awhile, but the operation we have alluded to has imparted confidence. It has sufficiently shown that, at a certain figure, there is a readiness to buy Lead, even in large lines, in anticipation of the fall demand that is to come. The market has been inactive since, but quite steady, some 100 tons changing hands between 5·95c. @ 6c., gold, for Domestic, while Foreign, as heretofore, with an occasional sale, commands between 6¾c. and 6⅞c., gold. Prices in Europe have apparently not yet touched bottom. The manufactures of Lead are steady at 8¾c. for Bar, 9¼c. for Pipe, and 9½c. for Sheet, less 10 per cent.

Spelter and Zinc.—Little business is transacting in Spelter, the sales being confined to small lots of Domestic at 7·15c. and 7¼c., currency, to supply immediate wants, while nothing transpires in Foreign, which we continue to nominally quote 7¼c. @ 7⅝c., gold. Europe is, on the whole, less active at the advanced rates demanded, the more pressing wants in England and France having from all appearances been attended to for the time being by the extensive spot and future purchases that were made during the month of May. Sheet Zinc remains unexcited at 8⅛c. @ 8⅝c., gold.

Antimony.—The moderate sales effected of this metal go at 13½c., gold, a figure not yet in keeping with the higher cost of importation. With a brisker demand, prices may harden.

COAL.

The demand for Coal has not been brisk, even with the limited supply sent to market, because it was only purchased for immediate use, but now that the companies have fixed their prices on board vessels at the different shipping ports, dealers and consumers can begin to lay in their supplies. Prices will be advanced every month up to November the same as heretofore, but what the advance will be each month will be determined by the committee, which meets every month for the purpose of arranging the advance, which will depend to a great extent on the state of the trade. So soon as matters are adjusted, and the trade resumes its usual regularity, there is expected to be a good demand that will take the production steadily.

The collieries that are in a condition to work will all be in operation in the course of the week. We give the loss and gain from the different regions since the strike commenced:

	Loss.	Gain.
Schuylkill	1,404,826	.....
Lehigh	1,507,048	.....
Wyoming, Lackawanna Reg.	.....	888,580
Shamokin	.....	67,670
Lykens Valley	.....	20,281
Bituminous moved toward the seaboard	..	56,187

As the lower portion of the Wyoming region was not at work to any extent, the whole gain was in the upper portion, known as the Lackawanna Basin.

We quote as follows: Anthracite, $4·85 @ $5·80; Cumberland, $6·50 @ $7; West Virginia, $6·75 @ $7; James River Steam, $6·25; James River Carbonite, $9 @ $9·50; Kanawha House, $14·25; American Gas, $7 @ $8·00; American Cannel, $12 @ $14; Pennsylvania and Westmoreland, $6·75; Murphy Run, $6·50; Newburg Orrel, $6·50; Sterling Ohio, $10; Ince Hall, $17 @ $18; Liverpool House Cannel, $17; Liverpool Gas, $12; Newcastle Gas, $7; Scotch, $7·50 @ $8.

The Coal transported over the Cumberland Branch Railroad during the week ending June 26, 1875, amounted to 6551 tons, as against 5778 tons shipped in the corresponding period of last year, showing an increase of 773 tons. Over the Cumberland and Pennsylvania Railroad, for the same period, the shipments were 53,749 tons, against 47,652 tons shipped in 1874, an increase of 6097 tons. The aggregate amount of Cumberland Coal shipped by the various companies so far this year amounts to 1,012,629 tons.

OLD METALS, PAPER STOCK, &c.

Business in this market still continues very dull, and our quotations remain the same as last reported, with the exception of Rags, which are without demand and have declined ¼ cent a pound. Old Metals remain unchanged, the demand being light, and stocks are abundant. Hemp and Grass Rope are inactive and unimproved, and are selling below quotations. The purchasing prices offered by dealers are as follows:

Old Metals.—Copper, 16c. @ 17c. per lb.; Yellow Metal, 11c.; Brass, 10c. @ 12c.; Composition, heavy, 13c. @ 14c.; Lead, solid, 5½c.; Tea Lead, 4½c.; Zinc, 4¼c. @ 4½c.; Pewter, No, 1, 18c.; do., No. 2, 8c. @ 12c.; Spelter, 5c. @ 5½c., Wrought Iron, 1¼c.; Sheet do., ¼c.; Cast, do., ½c.; Machinery, do., ¾c.

Rags, &c.—Canvas, Linen, 4½c. @ 5¼c.; do. Cotton, No 1, 5¾c. @ 6¼c.; No. 2, 2¼c.; White, No. 1, 6¼c.; No. 2, 4c.; Colored, do., 2c. @ 2½c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 5c. @ 5½c.; Gunny Bagging, 1¾c.; Jute Butts, 1½c. @ 2c.; Kentucky Bagging, 3c.; Book Stock, 3c.; Waste Paper and Scraps, 1½c.; Kentucky Bale Rope, 4c.; Oakum Junk, No. 1, 4⅛ @ 5c.; do. No. 2, 3c.; Tarred Shaking, 1c. @ 1¼c.; Grass Rope, 2¼c. @ 2¾c.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending June 29, 1875:

Hardware.

Anderson, Merchant & Co.
Files, cks., 22
Barton, Alexander & Waller,
Casks, 1
Wire, cks., 5
Calhoun, Robbins & Co.
Packages, 2
Fuller Bros.
Cutlery, cks., 1
Hardware, cks., 1
Friedmann & Lauterjung,
Mdse. pkgs., 3
Field A. & Co.
Casks, 1
Cutlery, cks., 2
Anvils, 1
Gillespie J. D. C.
Crates, 6
Guental Geo. & Co.
Cases, 27
Hoe H.
Pens, cs., 1
Hildick A. H.
Wire, cks., 1
Casks, 1
Anvils, 50
King, Briggs & Co.
Cases, 3
Lau & Garlichs,
Cases, 1
Laughland & Co.
Wire netting, cs., 8
Casks, 4
Bales, 3
Hay bands, bdls., 200
Merchants' Dispatch Co.
Cases, 2
Packages, 3
Owen A.
Packages, 4
Pendergrast Bros. & Co.
Wire rigging, coils, 10
Patterson Bros.
Packages, 4
Rosenthal J. & Co.
Packages, 1
Simpson T. H.
Packages, 4
Schuyler, Hartley & Graham,
Guns, cs., 1
Strasburger, Pfeiffer & Co.
Cases, 6
Sawyer John,
Wire rope, reels, 2
Spies, Kissam & Co.
Guns, cs., 2
Cases, 1
Tomes Francis & Co.
Guns, cs., 2
Taylor Thos.
Wire, pkgs., 2
Wiebusch & Hilger Mfg. Co.
Cases, 3
Order.
Cases, 12
Packages, 8

Iron.

Eneas Jos.
Scrap, tons, 6
Fleitmann & Co.
Plates, crates, 100
Flues, Spielmann & Co.
Sheet, bxs., 25
Irwin R. & Co.
Pig tons, 100
Leaycraft & Co.
Barrels, 13
Marvel Wm. D.
Ore, kilos, 420,000
Phelps, Dodge & Co.
Sheet, bdls., 112
Prosser Thos. & Sons,
Boiler tubes, bdls., 33
Windmuller L. & Roelker
Sheets, cks., 130
Order.
Pig, tons, 200
Plates, 4
Ore, tons, 267

Steel.

Hogan John,
Bundles, 58
Cases, 5
Jacobs, Strouse & Co.
Straps, cks., 6
Naylor & Co.
Frog points, 12
Bars, cs., 3
Castings, 6
Sulzbacher & Heyman,
Packages, 143
White L. C.
Bundles, 131
Order.
Scrap, spring, lots, 1

Metals.

Byrne Joseph & Co.
Tin plates, bxs., 700
Bruce & Cook,
Tin plates, bxs., 80
Cort N. L. & Co.
Tin plates, bxs., 1516
Canadian Bank of Commerce,
Tin plates, bxs., 722
Douglass Jas.
Scrap, copper, lbs., 46
Darrell & Co.
Scrap, copper, tcs., 2; cks., 1
Eneas Jos.
Brass, lbs., 3360
Haxtum B.
Lead, pigs, 4600
Jex Wm.
Scrap, copper, pkgs., 2
Leaycraft & Co.
Brass, cks., 9; barrels, 5
Copper, cks., 6
Lead, bbls., 31
Naylor & Co.
Tin plates, bxs., 80
Phelps, Dodge & Co.
Tin plates, bxs., 7600
Taggers, 60
Pearsall J. & T.
Scrap, pkgs., 6
Order.
Tin plates, bxs., 3419

PHILADELPHIA.

PHILADELPHIA, June 29, 1875.

The market presents no change since my last, unless it be that there are fewer transactions and more inquiry as to prices, resulting in no business. Prices are quotably as before, but the shading that is done to effect sales is sufficient to justify a quotation of a full dollar less all round in Pig Metal. There seems to be a disposition among Furnace men to increase production, since coal is more plentiful, and it is presumable that a better demand for Iron will shortly appear. Although there are now no large stocks of Pig Metal on hand, all reports to the contrary, notwithstanding there very soon will be if production is increased by one-half or one-third the stacks now idle. Manufactured Irons are as quiet as Pig, Bars especially being very dull, while Rails, although there are many inquiries, move very slowly. The Steel Rail trade is probably the best line now in the business, as all the works are busy on good orders, and some with enough to fill the remainder of the year. Old Rails are quiet, with small sales at last week's figures. Scrap is in fair demand, and some lots have lately arrived from England for this market which will leave a margin to shippers. The general tone of the market is weak, and there is nothing in the near future to indicate the probability of any change for the better. Prices continue as follows, nominally, but actually $1 less per ton will buy, and in some instances even a greater reduction:

PIG METAL.—No. 1 Foundry, $27; No. 2, $26; Gray Forge, $24 to $25.

MANUFACTURED IRONS.—BARS.—2·6c. to 2·8c. per lb.

RAILS.—$48 to $50, at works.

OLD RAILS.—$27 to $28.

SCRAP.—$31 to $32.

The sales have been very trifling, and include 1000 tons Mixed Nos. 1 and 2 Foundries at $26·50 and $25; 1000 tons No. 1, $27; 500 tons Gray Forge, $24; 1000 tons ditto on private terms; 1100 tons No. 2 Pipe Iron, $24. Rails—500 tons for Eastern delivery, $48; and 1100 tons for Western Road on private terms. Old Rails—500 tons equal to $27 here; and some small lots of Scrap, amounting in the aggregate to several hundred tons, at quotations.

PITTSBURGH.

PITTSBURGH, June 29, 1875.

PIG IRON.—While business is holding out very well for this season of the year, it is slacking off, as it nearly always does during the latter part of June, as it is customary with the most of the mills to shut down during the first half of July to take stock and make repairs; furthermore, the market for the products continues unsatisfactory, and then, again, the fact that an effort is being made to put up prices causes the mills to take hold sparingly and buy only to supply their immediate wants. There would be no difficulty in placing a considerable quantity for late summer and fall delivery at $24, 4 mos., which is regarded as the ruling price, but there are no sellers under $25, 4 mos., and producers generally appear confident of obtaining the price they are now asking, claiming that it is only a question of a little time. Several sales were effected this week and last, for immediate delivery, at $25, 4 mos., and $23·50 to $24, cash, but they were mostly small lots, and the iron was of a little better quality than ordinary, and beside it was wanted for a specified purpose. In a word, there is a difference of just about one dollar per ton between producers and consumers; the former are very urgent for better prices, claiming that current rates do not cover actual cost, while the latter, on the other hand, allege that the raw article is higher relatively than its products. The market for foundry grades continues quiet and unchanged.

QUOTATIONS.

No. 1 Foundry	$27 @ $28	—4 mos.
No. 2 Foundry	25 @ 26	—4 mos.
Gray Forge	24 @ 25	—4 mos.
White and Mottled	22 @ 23	—4 mos.

MANUFACTURED IRON.—The general position of the market for finished irons remains substantially unchanged, as compared with last week, with the exception that orders continue to fall off, and some of the mills have changed from double to single turn. Manufacturers all agree in reporting trade unsatisfactory, that, in consequence of a strong competition, prices have been forced down to a point that afford little or no margin for profit. Quotations are still made at $2·25 to $2·30, Pittsburgh, and $2·35 to $2·40, Eastern classification. Orders are still offering from the East, but at ruinously low rates, so low, indeed, are some of them that they receive little or no attention.

NAILS.—The nail trade continues to fall off; some of the factories have shut down and others are piling up, and it is probable there will be a pretty general suspension about the first of July. Prices, however, are maintained, but it is proper to state that there is no room for cutting, as current rates, $3, sixty days, do not much more than cover actual cost of manufacture. Horse Shoes continue fairly active, although this is usually considered the dull season.

STEEL.—There is nothing new to record in connection with the steel trade; business continues fairly active, the best evidence of which is that the mills are all in operation, as they have been ever since the first of the year. There is in this, as almost every other branch of business, a good deal of complaint in regard to prices, which have been cut so close that there is little or no margin for profit.

SCRAP IRON—Continues dull, as it usually is at this particular time, but an improved trade next month, or after the mills have got through stock taking, is expected. Prices unchanged, No. 1 Wrought $42 to $33, 4 months, delivered at mills.

NOVELTY GOODS.—The Jacobus & Nimick Manufacturing Company report a continued steady demand for locks, scales, knobs, as well as Novelty goods generally; that they have been working steadily ever since the 1st of January, with the exception of their foundry, which has been stopped temporarily to make some necessary repairs. No change in their price list or discounts.

The Pittsburgh *Commercial* of June 26th says: The metal market has continued rather quiet during the week, and the volume of transactions has been sensibly diminished, the aggregate of the sales reported being 1891 tons. This is due largely to the fact that the rolling mills are generally preparing to take account of stock, and, consequently, are not buying metal except as absolutely necessary. After the 1st inst. we may safely expect a somewhat more active business. Values are firm, and, indeed, there is a slight upward tendency, one sale of 200 tons gray forge having been made at $24·50, and two sales of 100 tons each, extra gray forge, at $25 per ton. The bulk of transactions is, however, at $24 for No. 1, at which rate 800 tons were sold. In addition to the sales given below we learn of a sale made by a furnace in the Shenango Valley of 5000 tons of Bessemer pig metal, to go to Johnstown, at a private price. Nothing of especial importance is reported in the way of muck bar, blooms or scrap iron. There continues to be an active movement of iron in these forms, as the mills are using them largely. Quotations are unchanged, and a few transactions are noted at $75 per ton for charcoal blooms; $42·50 for muck bar; $28 to $30 for ordinary Wrought Scrap. We report the following sales:

BITUMINOUS COAL SMELTED FROM L. S. ORE.

450 tons gray forge	$24·00	4 mos.
200 tons gray forge	24·50	4 mos.
200 tons neutral, gray forge	24·00	4 mos.
100 tons gray forge	23·00	— cash.
100 tons white neutral	22·00	4 mos.
100 tons gray forge, extra	25·00	4 mos.
100 tons mottled iron	22·00	4 mos.
100 tons gray forge, extra	25·00	4 mos.
100 tons gray forge	24·00	4 mos.
50 tons gray forge	24·00	4 mos.
20 tons foundry	26·00	4 mos.

CONNELLSVILLE COKE.

200 tons gray forge	$24·00	4 mos.

ANTHRACITE.

30 tons No. 1 foundry, extra	$28·00	4 mos.

CHARCOAL.

31 tons foundry H. R.	$30·00	cash and 4 mos

MUCK BAR.

100 tons neutral	$42·50	—4 mos.

BLOOMS.

10 tons charcoal	$75·00	4—mos.

BOSTON.

JUNE 26.—*Pig* would call for an imaginative mind to reveal any business or any change in prices. The market is at a complete stand, with sellers utterly indifferent to quotations. Buyers are somewhat anxious for sales, but for this week the reports received to all inquiries are that not a ton has been sold. The reports from abroad are still discouraging to foreign Irons, which have almost wholly lost their market here from the competition and excellence of American Pig, and must of necessity now sell at a dead loss to importers. This market is just now without quotations further than to be "a dollar or two above New York," which still quotes Eglinton, $29 to $30; Coltness, $31 to $32; Glengarnock and Gartsherrie, $31 to $33. American quotes on wharf, here, No. 1, $29 to $31; No. 2, $22 to $27, and Gray Forge, $21 to $24. *Bar* is having even less business than a week ago, and prices have again begun to vacillate. The range on job lots is from $58 to $60 for refined. At this price no one is disposed to sell a round lot, nor in fact is there any inquiry for such invoices. The stock is quite small, some sizes being quite scarce. In these odd and wanted numbers there is a slight move in common Iron, which sells down to $54. *Steel* is having a slightly improved inquiry for machinery and small tool, with prices steadily maintained. We quote American Tool, 15c. to 15½c.; American Machinery, 9½c. to 10c.; do. Cash Tires, 8½c. to 12½c.; Sweet's Excelsior Tire, 7c. to 7½c.; English Tool, 16c. to 17c.—*Com. Bulletin.*

CINCINNATI.

Messrs. L. R. HULL & Co., under date of June 28, write us as follows: PIG IRON.—The usual June dullness is prevailing to some extent, and consumers are not disposed to purchase in anticipation of their wants. Still, if the expected improvement in demand is realized next month, we may reasonably hope for a more buoyant feeling in all grades. The reports from the East seem to indicate that bottom prices are about reached, and if this is true the reaction may come at any time.

HOT BLAST CHARCOAL.

Hanging Rock	No. 1	₱ ton.	$28·00 @ 29·00—4 mos.
" "	No. 2		26·00 @ 27·00—4 mos.
" "	Forge		24·00 @ 25·00—4 mos.
Virginia	No. 1		27·00 @ —4 mos.
"	No. 2		25·00 @ —4 mos.
"	Forge		24·00 @ 25·00—4 mos.
Tennessee	No. 1		26·00 @ —4 mos.
"	Forge		24·00 @ 25·00—4 mos.
Alabama	No. 1		26·00 @ —4 mos.
Missouri	No. 1		28·00 @ 29·00—4 mos.
"	No. 2		26·00 @ 27·00—4 mos.

HOT BLAST STONE COAL.

Missouri	No. 1	₱ ton.	$28·00 @ —4 mos.
"	Forge		26·00 @ —4 mos.
Ohio	No. 1		25·00 @ 28·00—4 mos.
"	Forge		24·00 @ 26·00—4 mos.
Am. Scotch	No. 1		25·00 @ 26·00—4 mos.

COLD BLAST CHARCOAL.

Hanging Rock	Car Wheel	₱ tn.	$35·00 @ 40·00—4 mos.
Missouri	" "		35·00 @ 40·00—4 mos.
Kentucky	" "		35·00 @ 40·00—4 mos.
Tennessee	" "		30·00 @ 40·00—4 mos.
Georgia	" "		30·00 @ 40·00—4 mos.
Alabama	" "		32·00 @ 40·00—4 mos.
Machinery and Forge			30·00 @ 35·00—4 mos
Blooms			70·00 @ 90·00—4 mos.

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of June 28, writes us as follows: The market for all grades of metal is dull, with a strong tendency to inside figures. The usual time, 4 mos., is allowed on the following quotations:

HOT BLAST CHARCOAL.

No. 1 F'dry, from Hanging Rock Ores	$27·00 @	28·00
" 2 " " " "	25·00 @	26·00
" 1 Mill, " " "	23·00 @	24·00
" 1 F'dry, from Alabama, Georgia and Tennessee Ores	25·00 @	26·00
" 2 F'dry, from Alabama, Georgia and Tennessee Ores	24·00 @	25·00
" 1 Mill, from Alabama, Georgia and Tennessee Ores	23·00 @	24·00

HOT BLAST STONE COAL AND COKE.

No. 1 F'dry, from Hanging Rock Ores	$25·00 @	26·00
" 2 " " " "	24·00 @	25·00
" 1 Mill, " " "	23·00 @	24·00
" 1 F'dry, from Alabama, Georgia and Tennessee Ores	25·00 @	26·00
" 2 F'dry, from Alabama, Georgia and Tennessee Ores	24·00 @	25·00
" 1 Mill, from Alabama, Georgia and Tennessee Ores	23·00 @	24·00
No. 1 F dry, from Missouri Ores	27·00 @	28·00
" 2 " " "	26·00 @	27·00
" 1 Mill, " "	26·00 @	27·00

COLD BLAST CHARCOAL.

Car Wheel from Hanging Rock Ores	35·00 @	40·00
" " Tennessee Ores	30·00 @	38·00
" " Alabama and Georgia Ores	30·00 @	35·00
Car Wheel from Kentucky Ores	28·00 @	35·00

ST. LOUIS.

Messrs. SPOONER & COLLINS, Iron commission agents, 409 North Third street, St. Louis, under date of June 25, report the iron market as follows: Our market the past week has been quite dull, there being but little demand for Iron. Foundry Irons remain quiet, with some inquiry. Mill Irons dull. Car Wheel Irons very dull. We quote on 4 mos. time:

Mo. Stone Coal,	No. 1 F'dry.	$28·00 @	29·00	—4 mos.
" "	No. 2 F'dry.	26·00 @	27·00	—4 mos.
" "	No. 1 Mill	25·00 @	26·00	—4 mos.
" Charcoal,	No. 1 F'dry	28·00 @	29·00	—4 mos.
" "	No. 2 F'dry	26·00 @	27·00	—4 mos.
" "	No. 1 Mill	25·00 @	26·00	—4 mos.
Tenn. Charcoal	No. 1 F'dry	28·00 @	29·00	—4 mos.
" "	No. 2 F'dry	26·00 @	27·00	—4 mos.
H. R. "	No. 1 F'dry	29·00 @		—4 mos.
H. R. "	No. 2 F'dry	27·00 @		—4 mos.
H. R. "	No. 3 F'dry	26·00 @		—4 mos.
Massillon,	No. 1 Foundry	36·00 @	37·00	—4 mos.
"	B, No. 1 Foundry	34·00 @	36·00	—4 mos.
"	No. 2 Foundry	33·00 @	34·00	—4 mos.
Cold Blast Car Wheel,	Mo.	37·00 @	40·00	—4 mos.
" "	Tenn.	35·00 @	40·00	—4 mos.
" "	Hanging Rock	53·00 @	55·00	—4 mos.
Mo. Charcoal Blooms		75·00 @	85·00	—4 mos.
No. 1 Wrought Scrap				1¼c. per lb.
Machinery Cast "				1c. "
Stove Plates				¾c. "

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, South Charles and Lombard streets, report us the following prices under date of June 29: We have to report a dull and depressed market, and with no quotable change for the past week, with the exception of Horse and Mule Shoes, which have declined 75 cents per keg.

AMERICAN REFINED BAR IRON.

1 to 6 wide by ⅜ to 1 thick.. } 1 to 4½ wide by 1½ to 2 thick }	2·6-10 to 2 7-10c. ₱ lb.
Round and square, ordinary sizes, from ⅜ to 2 inclusive	2 6-10 to 2 7-10c. "
Hoop Iron, 1½ wide and upward	4½ to 4¾c. "
Band Iron, from 1¼ to 4 in. wide	3¾ to 3¾c. "
Horse Shoe Iron ⅜ to 1 wide by ⅜ to ½ thick	4 to 4¼c. "
Norway Nail Rods	7 to 7¼c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	15½ to 16c. "
Machinery Steel	11 to 11¾c. "
Cast Spring Steel	10 to 10½c. "
Homogeneous Steel Plate	10½c. "
Perkins' Horse Shoes, per keg of 100 lbs	$4 87½
" Mule Shoes " "	5·87½

Common Horse Nails, from 14c. to 18c. per pound.

	10	9	8	7	6	
Putnam Horse Nails	23	24	25	26	28c.	per ₱.
	10	9	8	7	6	
Globe Horse Nails	23	24	25	26	28c.	per ₱.

R. R. Spikes.....5½ by 9-16 at 3c to 3¼c. per lb.

Messrs. R. C. HOFFMAN & Co., Iron and commission merchants, Nos. 23 and 25 South Frederick street, report the Pig Iron market as follows, under date of June 29: We have no change to note in the Iron market since our last report. We quote:

Baltimore Charcoal	$32·00 @	35·00
Virginia "	30·00 @	35·00
Anthracite No. 1	27·00 @	28·00
" No. 2	25·00 @	26·00
" No. 3	23·00 @	24·00
White and Mottled	20·00 @	22·00

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels.)

PARIS, June 13, 1875.—*Metals.*—The English failures have thus far produced no feeling of panic anywhere, and the metal trade at large has not been affected thereby. This is due, in a great measure, to the conservative spirit which has prevailed in trade circles for a year past, extreme caution being the watchword, both in England and on the Continent. It is due to the shunning of all over-trading, and the consequent ease in money matters. Speculation having been forced back within a narrow compass extravagant prices having ceased to rule, the failures alluded to have occurred during a period devoid of undue expansion, and, therefore, not liable to a sudden collapse. The framework of trade is no doubt sound at present in Europe, and eventually consumption, even in the Iron branch, will produce a favorable change. The process is a slow one, but it is all the safer. *Copper* has lacked animation during the week under review. The charters on the West Coast are on a moderate scale, yet speculators for a rise have abstained from operating for the general reasons given above, notwithstanding the well ascertained fact that the arrivals of Copper from Chili within the ensuing two months will be quite moderate—indeed, hardly sufficient to keep up an adequate supply, should trade in the metal become brisker. At all events, even but limited deliveries to consumption will suffice to reduce the available supply in England and France to a comparatively low ebb, and toward the middle of August speculators for a rise are likely to find a remunerative field for their labors. The Paris market continues languid in the extreme. We quote unaltered as follows: Chili Bars, 217·50 francs; English Tough Cake, 225; Common Chili Bars, 216·50; ditto Ingots, 228·50; and pure Corocoro Ore, 215. Nothing transpiring at Havre on the spot, where prices slowly follow the fluctuations of the London market. Copper is firm at Marseilles on the basis of 220 francs for Refined Ingots. *Tin.*—The previous week's improvement has been lost, and quite an uncertain aspect now intervenes, the result of speculative movements. It is difficult to surmise what the upshot will be. Here a decline has taken place. We quote Banca, deliverable at either Havre or Paris, 230; Straits, 217·50; and English, deliverable at either Havre or Rouen, 235. Tin is quiet at Marseilles, Straits and Billiton at 215, and English, 235. *Lead.*—The tendency has been an uninterruptedly downward one pretty much all over Europe, due principally to more liberal supplies from Spain. We have, consequently, been quite weak here. French, deliverable at Paris, 56 francs; Spanish, at Havre, 55. At Marseilles Lead has experienced a severe tumble in the absence of all export orders. Spanish is quoted there 51 francs. *Spelter* has remained quiet, but firm, in the London market, with rather an upward tendency. We have not varied here, and quote Silesian, deliverable at Havre, 63 francs; other good brands, 62. The Vielle Montagne Co. has raised the selling price of Sheet Zinc 5 francs the 100 kilos, and it now commands 80 francs in the Marseilles market, and all over France generally. *Iron.*—The critical period which French Iron industry is traversing for such a lengthened time past is, from all appearances, not yet at an end. A good many recent occurrences, however, point to a favorable change near at hand. Thus, a good many orders are dropping in in the Iron regions of France for a replenishment of stocks, in amounts sufficiently considerable to obviate the necessity of reducing list prices. Here, at Paris, the market remains quiet; orders are scarce, and there is great competition for them. In the St. Dizier district a good, steady business is transacting in Machinery, Hoops and Chains, likely to keep the works in that vicinity busy for some time to come. A business moderate in extent, yet satisfactory, is doing at the North; No. 2 Merchants' Bars we quote 209 francs. In the Meurthe and Moselle, at Longwy, affinage Pig commands 70 francs; at Nancy, 72·50; No. 3, 94; No. 1, 110. First-class Merchants' Iron, coke, is quoted 210 francs. The attention of the Minister of Finance has been called to certain surreptitious, fraudulent dealings in Pig Iron imported from Luxemburg, injurious both to the public exchequer and to French Iron masters. *Coal.*—The decline seems to have been excessive, and there is a tendency in Coal not to go lower for the present.

BELGIUM.

(Revue Universelle).

BRUSSELS, June 13, 1875.—*Iron.*—Stagnation in the Iron trade in Belgium is getting well nigh chronic. The only recent deliveries for railroad purposes have been between 500 and 600 tons Rails for the horse railroads of Antwerp, and 500 Railroad Cars for the State railroads. Continual efforts are being made by Belgian firms in the Iron and Machinery line to extend business relations to distant foreign countries; thus another merchant has left for Brazil and other portions of South America, yesterday. The Sciessin Society has been authorized to erect, in addition to the one recently constructed, three blast furnaces with hot air apparatus and other appurtenances. Prices of Pig and Wrought Iron remain weak, but have undergone no decline yet. A good deal of interest has been excited in Europe by the reports about the Danks mechanical puddling process, initiated at Cincinnati and Pittsburgh. It is expected that its introduction into South Staffordshire will soon become an accomplished fact, and that the Continent will be compelled to adopt the same system. *Coal.*—Very little transpires in this fuel, which has become unusually dull, owing to the season. The gradual decline has now lasted precisely two years. Since the reduction in wages in South Wales, Belgian Coal producers will have to make additional efforts by the introduction of labor saving machinery, to bring down the cost of Coal at the mines to a still lower figure.

GERMANY.

(Borsenhalle.)

HAMBURG, June 12, 1875.—*Metals.*—The general apathy in the German metal markets continues uninterrupted, nor do we expect much of an amelioration in this respect till after mid-summer, when the approach of the autumn campaign will induce the replenishment of supplies. *Copper* is weak in the absence of a demand for consumption, and quotations are but nominally supported. At Stettin, Copper is worth 105 marks; here we quote Drontheim, 94 marks; Lake, 100. About 10,000 pounds of old Yellow Metal have sold at 54 marks. *Tin.*—The recent improvement in Holland and England was, as is usually the case, received with a good deal of suspicion in the German markets, and the subsequent course of values in those countries has shown that it is not easy to uphold prices as long as the supply largely exceeds the demand. No change here. *Lead.*—There is no feature of special interest apparent. At Stettin, Spanish sells at 27 marks, German at 24. Here we are weak at 23·75 to 24 for German, and 25·50 to 26 English, while Spanish brings 25 to 25·50. *Spelter.*—The German markets, at the high figures demanded, show but little vitality. No transactions are reported from Breslau. Here the available supply is exhausted. We quote futures 24·50 marks, nominally. Stettin still keeps up the quotation of 27 marks.

RUSSIA.

(Golos).

MOSCOW, June 1, 1875.—*Iron.*—In 1866 there were in operation in Russia but 100 iron-works, whose annual sales amounted altogether to 15,000,000 roubles, one-half of which employed steam. There are now 362 foundries and machine shops in full operation within the empire, 79 of which are exclusively devoted to turning out agricultural implements. Out of the 362 now extant, 179 employ altogether 46,285 operatives, and produce goods to the amount of 49,000,000 roubles per annum; 161 of them employ steam. In 1868 there were built in Russia but 222 locomotives, while in 1874, 768 were turned out. Out of 702 steamboats now navigating in Russian waters, 484 were built in this country. In spite of the activity thus displayed, Russia imported hardware to the amount of 2,000,000 roubles annually between 1850 and 1856, inclusive; upward of 8,000,000 annually between 1857 and 1864; upward of 13,000,000 between 1865 and 1868, and above 32,000,000 annually between 1868 and 1873. There are at present turning out rails exclusively four establishments, one of them the property of the State, one of Prince Demidoff, one of Mr. Putilow, and one of the Great Railroad Company of Russia.

HOLLAND.

(Koch & Vierboom.)

ROTTERDAM, June 15, 1875.—*Tin.*—A little firmer again with sales of Banca, spot, at 50⅛, and from the coming July auction at 50¼ guilders; Billiton, spot, 48¾.

EAST INDIES.

(Aitken, Spence & Co.)

COLOMBO, Ceylon, May 11, 1875.—*Plumbago.*—Lead of prime quality is almost unobtainable; the demand continues limited, and prices are unchanged. The Pandita is nearly loaded, and will sail early this week. Total export of Plumbago from Ceylon to all points since October 1: 66,415 cwts. against 109,227, 94,266 and 72,575 in 1874 and 1873. Great Britain thus far took 43,631; the Continent, 1448, and the United States, 21,336. *Exchange* has been declining. We quote: 1/10 7-16 to 1/10 9-16d. MAY 15.—The Pandita has sailed, taking 46(9 cwts. for New York. The market closes quiet, but steady as follows: Lump, free on board, without freight, 80/ per ton; Chip, 80/, and Dust, 70/.

(Sandilands, Buttery & Co.)

PENANG, May 3, 1875.—*Tin.*—Owing to some demand for India, prices could at first be maintained at $22·50 per picul for unsmelted; however, continued unfavorable advices from home soon caused a decline, and since then small purchases were made at $22·50 to $22 per picul for unsmelted. Supplies have been unusually small, and the stock in the Bazaar does not aggregate more than 2000 piculs. *Exchange* slightly weaker at 4/2¼d. to 4/3d.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, ENG., June 14, 1875.

THE TRADE OUTLOOK.

There is no material alteration in the actual state of trade, neither is the outlook brighter. The effect of the failures, detailed in my last communication, has very rapidly worn off, which, at least, shows that no further very heavy suspensions are looked forward to, and that matters are at so low an ebb that a further drop is hardly possible. I can, of my own knowledge, state that there have been several very narrow escapes from financial shipwreck; the rock on which two or three goodly vessels nearly split being "foreign investments." Some day before long I will take advantage of my position and inflict on your readers a pretty little tale—not fiction—as to the manner in which a number of English capitalists recently invested their monies in a foreign "countree," and got so dreadfully frightened that two or three of them very narrowly missed falling from the high social positions to which they had climbed through many years of hard and unremitting industry. It is an instructive story, and as the scenes happen to be laid in a certain district of the United States, and a town within a thousand miles from Sheffield, I will some day "the tale unfold." Returning to our metallic "muttons," I may say that the price of common and second-class finished iron is slightly lower, that rails are nominal, that tin plates are dull, that pig iron is considerable easier, that hardwares are quiet but steady, and that metals are apathetic.

HOW MUCH COAL HAVE WE?

It would appear that we have now a great deal more coal than we had according to the report made by the coal commission in 1870—that is, if we may credit certain statistics recently set forth at a meeting of the South Staffordshire Forge and Mill Managers' Association by Mr. Wm. Edwards, manager to John Bagnall & Sons (Limited). That gentleman's conclusions are that in the South Staffordshire district great quantities of coal will be available in consequence of the report of the Mines Drainage Commissioners, under a special act, and owing to the discoveries of coal in localities not before believed to contain the mineral. The Sandwell estate consists of 1000 acres of thick coal; Lord Calthorp's estate, of 1400; General Studd's, of 500 acres; the West Bromwich Colliery Company have 50 acres in the solid to get; the Sponlane Colliery Company have 50 acres of thick in the solid, and 60 acres of broken mine; the Blakeney-hall estate 70 acres in the solid to get; Earl Dudley's new colliery at Lye-cross has proved 500 acres of thick coal in the solid, 10 yards thick; Messrs. Hunt are getting thick coal in three pairs of pits, which in all range from 20 to 30 yards thick; the new coal fields in the Cannock Chase district, embracing an area of 93 square miles, have an average thickness of workable coal (above 2 feet thick) of 50 feet. Of this total about one-fourth has been got, and three-fourths, or 1,024,000,000 tons, remain to be gotten; while in 1870 it was estimated by the Royal Commission that there were only 968,000,000 tons to be gotten there. The district of North Staffordshire has an area of coal fields, exclusive of the Cheadle and Goldsitch basins, of 75 square miles, and the available weight of coal, at a depth of 4000 feet, is 3,720,000,000 tons. In 1870 this coal field yielded 3,873,512 tons of coal. The Cheadle coal field contains about 104,524,000 tons of coal available for future use, and the Goldsitch Trough is supposed to consist of 117,000 tons. Yorkshire, Derbyshire and Nottinghamshire are supposed to have of coal 900 square miles, and a total weight of 28,082 millions of tons. These fields in 1870 produced 17,824,241 tons. South Wales, in 1870, was supposed to contain 906 square miles of coal to 4000 feet depth, and it was calculated that this area would yield 31,783,000,000 tons of coal, and that if the rate of production of that year (13,664,112 tons) was kept up, the coal would last for more than 2300 years; and recently there have been extensive new discoveries. Scotland is supposed to have 9,843,465,930 tons of coal, and Durham 796 square miles of the mineral, weighing 7,452,250,000 tons. Shropshire, North Wales, Cheshire, Lancashire, Northumberland and Cumberland, with other countries, are found to contain more fuel than had been expected. The production of coal in Great Britain was in 1872 greater than in any previous year, being a total of 120,000,000 tons. Of the 178,000,000 tons known to have been raised anywhere during 1865, 100,000,000 tons were brought to bank in Great Britain. The capability of Great Britain to bring coal from the greatest possible depths was illustrated in the circumstance that already the deepest pit worked by a perpendicular shaft was in this country; it was the Arley pit, at the Rosebridge colliery pit, near Wigan, which, it was explained, goes down 2445 feet; the pit in Belgium, whence coal is being brought up from a depth of 4000 feet, being worked in three inclines, with as many engines.

BANKING AND DISCOUNTING.

The *Economist* has some comments upon the dangers of our banking system as applied to the discounting and rediscounting of "paper." It remarks that the Aberdare Company drew on the Plymouth Company, and these bills having been discounted by Sanderson & Co., were rediscounted at some of the principal banks. If due care had been observed, the *Economist* contends, this could not have happened. A careful scrutiny should have at once detected the unsound character of much of the Aberdare Company's paper. The extensive rediscounting should have been impossible. All banking, of course, rests on credit, which is in itself natural and right, but brings a risk with it which must be provided against. Our modern system of deposit banking is essentially a new thing, and, although we enjoy its advantages, we scarcely appear sufficiently alive to all its dangers. The Aberdare Company could not have been so largely supported by fictitious paper had our banks been as judicious as large.

THE SCOTCH PIG IRON MARKET.

The Scotch pig iron market was very inactive during the greater part of last week, and for a time a general listlessness prevailed. On several days there was only *one* transaction in warrants, which opened on the week at 59/6, but fell 2/ by Thursday, on the afternoon of which a little rally took place. The spurt sent up figures a shilling or so, but they are not strong at the rise, and a relapse may set in during today. There are now 121 furnaces blowing in Scotland out of a total of 196. The stock in Connal's stores on Friday night (and this morning) is 37,440 tons, beside what lies in the yards of the several makers. Freights to the principal American ports are as stated last week. Ballast pig iron has fallen to 53/ per ton, and some of the makers' special brands are easier. Writing from Glasgow June 11th (night), Messrs. James Watson & Co. said: "The pig iron market opened this week at 59/3, but receded to 57/9, cash, on Wednesday, closing firmer to-day at 58/9 buyers; sellers, 59/. Shipments last week were 8708 tons, against 5360 tons in the corresponding week of 1874.

	No. 1.	No. 3.
G. M. B., at Glasgow	61/	59/
Gartsherrie, "	65/6	62/
Coltness, "	66/6	63/
Summerlee, "	65/6	61/6
Langloan, "	64/	61/6
Carnbroe, "	62/	61/
Calder, at Port Dundas	65/6	62/6
Glengarnock, at Ardrossan	67/6	61/6
Eglinton, "	59/6	58/6
Dalmellington, "	60/6	59/6
Shotts, at Leith	65/	63/6
Kinneil at Boness	62/6	59/

Messrs. Wm. Colvin & Co. (Glasgow, June 15th) say: "The warrant market improved a little toward the close of last week, and business was done on Friday up to 59/. This week the tone has continued steady, the price ranging from 58/9 to 59/3, and closing this afternoon with buyers at 58/9, and sellers at 59/. The market for makers' iron has also assumed a more settled aspect, and there is little or no change in prices to report:

	Deliverable alongside. No. 1.	No. 3.
G. M. B., at Glasgow	60/6	58/6
Gartsherrie "	65/6	61/
Coltness, "	67/	63/
Summerlee, "	65/	62/
Langloan, "	64/	62/
Carnbroe, "	61/	60/
Monkland "	60/6	59/
Clyde "	61/	59/
Goven, at Broomielaw	61/	59/
Calder, at Port Dundas	65/	63/
Glengarnock, at Ardrossan	67/6	61/
Eglinton, "	60/	59/
Dalmellington, "	60/	59/
Carron, at Grangemouth, selected	70/	..
Shotts, at Leith	66/	63/
Kinneil, at Bo'ness	61/	59/
Bar Iron	£8. 10/ to £9. 10/	
Nail Rods	£9. 10/.	

SHIPMENTS.

	Tons.
Week ending June 12, 1875	11,625
" June 13, 1874	5,483
Increase	6,142
Total increase for 1875	52,536

Messrs. John E. Swan & Bros. (limited), prices current are:

Glasgow Brands.	Furnaces B'wing, 123	Furnaces Out 34.	Furnaces Built, 157.	Prices. No. 1.	No. 3.	No. 4
Gartsherrie	13	2	16	65/	61/	62/6
Coltness	12	0	12	67/	63/	..
Summerlee	6	2	8	65/	61/	62/
Langloan	7	1	8	63/	61/	62/
Govan	4	1	5	60/	59/	62/
Calder	6	2	8	*66/	59/6	62/6
Shotts { Bess'mer	5	2	7	85/	..	..
Shotts { Ordinary				65/	63/	62/
Carnbroe	4	2	6	60/	59/	62/6
Wishaw	2	1	3	..	..	..
Monkland	8	1	9	60/	59/	60/
Chapelhall				..	..	..
Clyde	6	0	6	60/	59/	59/6
Quarter-Clyde	4	1	5	60/	59/	59/6

*f. o. b. Glasgow, 1/ per ton, extra.

Glasgow Warrants, 3-5 No. 1; 2-5 No. 3, g. m. b., 58/9.

WEST COAST BRANDS—*f. o. b. Ardrossan.*

Glengarnock	7	2	9	67/	61/	62/
Ardeer	4	1	5			
Eglinton { Brand'd	6	2	8			
Eglinton { Egl'n	4	0	4	59/	57/6	60/
Lugar	3	0	3			
Muirkirk	3	3	6			
Portland	6	2	8			
Dalmellington				61/	58/	59/

EAST COAST BRANDS—*f. o. b. in the Forth.*

Kinneil	3	1	4	61/	59/	59/6
Almond	2	1	3	62/	60/	59/
Carron { Selct'd	5	1	6	67/6	..	..
Carron { Ordn'y				66/	..	..
Lochgelly	1	3	4	60/	58/6	59/
Lumphinnans	0	2	2	..	..	..
Bridgeness	0	2	2	..	..	..

TRADES OF SHEFFIELD.

It was well known, as stated in my last week's letter, that a local concern, the Phœnix Bessemer Steel Company, limited, was a creditor for a large amount in the estate of Gilead Smith and Company. The fact was so soon established that the shares of the Phœnix Company began to be "knocked out" on the Stock Exchange, and so roughly treated that from 20 dis. they fell to 43 dis., the amount actually paid up being £40 per share. In the afternoon of the day named the directors, after several preliminary consultations, met and finally determined to go into liquidation. A circular was got out the same evening for issue to the creditors the next day stating this fact, and that owing to the heavy and unforeseen loss sustained by a London failure, the scheme of reconstruction, which was nearly complete, could not be carried through. The creditors, consequently, met at Sheffield on Wednesday, June 9th, with the result detailed below, and the shareholders will meet on Friday at Rotherham. The capital of the company is £100,000, of which £80,000 are paid up. The trade liabilities of the company were not precisely known, but were stated to be somewhat about £100,000. The works have been stopped in a great measure, 400 to 700 men being employed. At the meeting of creditors on Wednesday, however, an authoritative statement both of facts and accounts was given. Mr. Josiah Smith, manager of the Barrow-in-Furness Steel and Hematite Company, was voted to the chair, there being also present Mr. Jackson, Solway Iron Company, Maryport; Mr. Buckton, Leeds; Mr. Robinson, London, and gentlemen from Darlington, Manchester, Liverpool and other towns. The report read by the company's solicitor stated some of the foregoing facts, and in addition that Gilead Smith & Co.'s order was for 5000 tons of rails, 4500 of which had been sent off. The arrangement for these rails was that three-fifths of the payments should be made in cash and two-fifths in acceptances. Warrants had been issued for the quantity delivered, or held as per arrangement, and these had got into third hands, the present holders claiming that they had a lien upon them superior to that of the vendors. This will, of course, have to be decided by the court. The statement of accounts submitted gave the following detals:

LIABILITIES.

Open accounts	£80,061	0	2
G. Smith & Co.'s acceptances, under discount	14,155	18	2
Mortgages and debentures	45,205	0	0
Total	£139,421	18	4

ASSETS.

Book debts	£30,023	0	0
Stock and tools	50,267	0	0
Cash and sundries	570	0	0
Uncalled up capital, estimated	17,000	0	0
	97,860	0	0
Deduct for secure creditors	13,000	0	0
Total	£84,860	0	0

After considerable discussion it was resolved that the affairs of the company would be best wound up by adopting a voluntary liquidation under the supervision of the Court of Chancery.

In addition to the case of the Phœnix Company, there were very ominous rumors in circulation here on Friday and Saturday last, as to the credit of certain other firms and persons said to have been involved in the recent failures, or by other circumstances. I have some pleasure, however, in stating that, although some concerns in this vicinity were creditors for heavy amounts with one London house a fortnight or so since, they "backed out" in time, having had early warnings from their London agents. Had this backward movement not been accomplished, the result would, I am afraid, have been far more disastrous than in the case of the Phœnix. I can also state, on most excellent authority, that the rumors which have for some time been in circulation here, may, and ought to, cease, seeing that there is no longer any ground for whispering in the one particular instance to which I allude. I also believe that in two or three other directions, unfair suspicions are being entertained, there being very little reason indeed for their propagation or existence.

A somewhat sensational story having been circulated by the newspapers as to an alleged, very serious fire having taken place at the new collieries of the Barrow Steel Company, at Worsboro', South Yorkshire, Mr. George E. Chapman, the company's colliery manager, writes to make several corrections. He states that the pit in which the fire took place is 324 yards deep, not 325 ft., and that during the last twelve days, prior to Thursday, the sinkings had passed through thin beds of Cannel coal which held gas, necessitating the use of safety lamps. On reaching hard spavin the shaft was bricked up and the flues were collected above the seams where the gas lodged in three 6 in. pipes, 24 ft. up the back side of the brattice boards. After firing a sump shot on Thursday morning, however, a flash of light was seen and a slight concussion felt, the lowest length of brettice being observed to be on fire. Water was at once pumped in, promptly extinguishing the blaze, and on Friday water drawing was commenced. Mr. Chapman believes that the fire was caused by a splinter from the spavin sent up by the shot striking and breaking one of the pipes, the liberated gas being ignited by coming in contact with the burning fuse.

At the Rockingham colliery of Messrs. Newton, Chambers & Co., great progress has been made since March last, when the shaft got on fire, a depth of 290 yards having now been reached.

Taken as a whole, trade remains in a very quiet condition, but there is a clearly more healthy tone than was apparent last week. The transactions on record are not numerous, and the lots of iron changing hands are not large, so far as pig and merchant irons are concerned, dispite the downward tendency of prices. Hematite pig irons are nominally quoted at the following figures: Maryport hematite, No. 3, 82/6; No. 4, 82/; mottled and white, 80/; Bessemer, No. 1, 85/; No. 2, 82/6; and No. 3, 80/ per ton, less 2½ for cash. Millom Bessemer, No. 1, 90/; No. 2, 87/6; and No. 3, 85/; ordinary, No. 3, 85/; No. 4, 83/; No. 5, 87/6 to 90/; mottled, 93/; and white, 88/, per ton on the usual terms.

There is a good inquiry for ship, boiler and armor plates, but very little new business in rails. Such orders as have recently been placed locally for steel rails have been at exceedingly bare prices, one concern being especially spoken of in the trade for its cutting propensities.

The cast iron industries are a little busier, there being a fairly good call for plough plates, wire, tool steel, and crucible steel castings.

The members of the various branches of the cutlery trades are very pleased to observe from the last Board of Trade returns that the United States are again buying the productions in which Sheffield is so largely interested, on a somewhat broader scale. Most departments are fairly well engaged but there is no pressure. Prices of good table cutlery are firmly maintained.

RAILROAD IRON EXPORTED.

The following figures, detailing the exports of railroad iron during the first five months of 1874 and 1875 respectively, had not reached me when I wrote last:

Railroad, of all sorts.

To	1874.	1875.
Russia	49,258	15,894
Sweden and Norway	28,296	18,518
Denmark	4,583	2,013
Germany	3,172	671
Holland	3,967	2,284
Belgium	12,216	406
France	739	45
Spain and Canaries	9,869	5,196
Italy	9,054	3,148
Turkey	6,784	28
Egypt	10,623	192
United States	52,445	13,888
Brazil	9,853	5,028
Peru	4,185	11,037
Chili	5,663	10,458
British North America	20,259	36,380
" India	22,662	14,464
Australia	32,217	36,299
Other countries	49,248	25,270
Total	335,093	201,219

SOUTH STAFFORDSHIRE AND BIRMINGHAM.

At the week 'change meeting, Wolverhampton, there were no very notable transactions either in pig or any description of finished iron. Common merchant iron could again be obtained at prices a shade under those current last week, but best brands of finished iron were upheld at the full list quotations. Best bars were, therefore, still £11, with an extra 12/6 for Lord Dudley's make. Good boiler plates from the establishments of makers whose productions are known to be of reliable quality, were fully £12. 5 to £12. 10. Sheets of No. 24 gauge and best quality were £11. 15, but a commoner description of slagles might have been obtained at £11. 7/6. Common bars were in plentiful supply at £8. 5/ to £8. 7/6. At the Birmingham weekly 'change assembly a few specifications for finished iron were given out, but there was no weight of material transferred from sellers to buyers, or rather from possible sellers to nonexistent buyers. Prices were in the main very similar to those just given. In the hardware departments there is a tolerable amount of activity, but there is again a little talk of foreign competition. American curry combs, and even padlocks are spoken of as being in various markets at prices under those of the Willenhall makers, both classes of goods being admittedly equal in general get up and finish to the English articles.

SOUTH WALES.

The coal trade of Newport and Cardiff is now getting stronger, and the shipments are fast assuming their wonted proportions. At the Ebber Vale, Tredegar, Rhymney and Dowlais works iron is being made on a tolerably large scale, but there is no reason for supposing either that a large output will immediately follow, or that the existing quotations are sufficient to yield any profit. One of those courses must therefore be taken: the works must remain idle, coal must be lowered, or wages must again be reduced. That the demand will so revive as to solve the difficulty appears, at present, highly improbable.

THE METAL MARKETS

have been very quiet during the last week, no transactions of weight having taken place. Prices have been fairly firm, but there are generally drooping tendencies.

Messrs. Van Dadelszen & North say: The prevailing tone of the metal market during the past week has been one of great quietness, although prices show no change of any importance. The rate of discount remains at 3½ per cent. *Iron.*—The reports from the manufacturing districts are anything but cheerful, orders remain very scarce, and manufacturers would make concessions in price if orders of magnitude had to be given out. Scotch pig iron has fluctuated but little; the closing price to-day is 58/6. The shipments last week were 8708 tons, against 5360 tons for corresponding week 1874. *Copper* has ruled firm but quiet, and very little business reported. Chili bars remain at £82. 10/ for g.o.b. and £83 for named brands. Several cargoes of regulus have changed hands at 16/9 to 17/1½ per unit. Australian sorts quite neglected and nominal. English copper steady, but lifeless. *Tin.*—For a few days there was a good demand at advancing prices, but it has since given way again. The highest price for Straits was £85 cash and £84. 10/ for forward delivery, but it is now obtainable at £84 and £83 respectively. Australian, after touching £82. 10/, relapsed to £82 sellers. Banca remains at 50½., and Billiton 48fl. English without change, and in poor demand. Tin plates have further given way in price; large quantities of good ordinary coke are offering in Liverpool. Charcoal neglected. *Lead* has become dull, at a decline of 5/ per ton from last week's quotations. Good English pig, £22. 10/ to £22. 15/. *Spelter.*—Occasional transactions are reported in Silesian at £24 here for ordinary brands, and £24. 5/ to £24. 10/ according to brand. In outports English quite nominal. *Quicksilver*, £12 per bottle.

Messrs. Berger, Spence & Co's. report today, is: The iron market has been relieved of a good deal of its anxiety by the remarkable harmlessness of the recent failures. The atmosphere, it is true, is still anything but clear; rumors of new embarrassments, though still in their first vagueness, have not quite lost their power of pursuasion; but with all the probabilities of impending danger, there has nevertheless been a most cheering absence of anything like undue caution, and not a few of the late sales thereby developed into proportions which must have seemed hardly attainable a week ago. The change, though perhaps too manifestly momentary to bode any general and lasting improvement, may yet prove more than ephemeral in the Glasgow market. Scotch prices have shown rather less sympathy with the fluctuating warrants, and their comparative steadiness is, in our opinion, too well justified to inspire anything but confidence in their early recovery. The point they have now touched undoubtedly is the farthest stretch the present cost of labor can allow, and this fact, corroborated by the reduction of wages lately intimated by some of the iron masters, cannot but hasten the advent of a better demand. Middlesborough make, though not entirely neglected, has hardly, if at all, had any share in the amelioration. This, however, can scarcely be surprising in the presence of the last returns. The makers' stocks, which were 79,021 tons at the end of April, have since swelled into 101,491 tons, although the make remained stationary within 78 tons. *Copper* continues quite. Regulus, of which two cargoes were sold, realized 17/ and 17/ 1½d. per unit. The charters for the last fourteen days of May represent 1900 tons of fine copper. *Lead* has been much steadier, the demand for consumption having been somewhat stronger. *Tin* was quoted rather higher at the beginning of the week, but the prices have since gradually receded, and are still tending downward. In *Spelter* moderate business has been done at former rates.

The *Mining Journal* remarks: "*Copper.*—The market opened firm at the beginning of the week for foreign copper, and business was reported in Chili bars, g. o. b., at £82. 10/ to £83, cash, and at the former price, with three months' prompt. Throughout the week there has been hardly any variation in quotations. The market has been quiet. *Lead.*—There has been very little activity presented in this market, and quotations are easy, in consequence of the slackness of the demand. Good soft English pig is readily obtainable at £22. 10/, and soft Spanish, without silver, £21. 15/. *Spelter.*—Silesian is quoted £24 to £24. 5/. The market is devoid of animation. *Quicksilver.*—There is no change in the value of this metal, transactions being reported at £12 per flask. *Tin.*—The market has assumed a very uncertain aspect, resulting from the action of speculators more than from any other cause, and being thus under the influence of speculation to a great extent, it is impossible to speak with any degree of assurance as to the ultimate course it may take. *Tin Plates.*—What support the market has obtained results from foreign shipments, and judging from the published returns, these have been satisfactory; but the make of tin plates is now so large that competition has driven the price down, and plates have been offered by one or two houses at a figure which is said by the majority of manufacturers to be utterly unremunerative.

Paints for Engineering Structures.

BY EARNEST SPOW.

After questions of form, strength, constructive material and similar matters have been duly settled in connection with any engineering work made of wood or metal, the engineer has to consider the best method of maintaining that work in good condition. Apart from working casualties, the material of which the particular work is constructed is exposed to atmospheric and chemical influences which tend more or less to modify and corrode its surface, and an artificial surface is therefore formed by applying paint. Most of the paints used for ordinary work are composed of the coloring matter, then of a quantity of white lead, with which and a particular oil they are worked into a paste of the shade required, and are afterward trimmed down with oil and turpentine when used. The white lead which thus forms the basis of most paints, and is by itself a color, is the basic carbonate of lead, a heavy earthy powder, white when first made, but soon becoming of a grey tint when exposed to the air, from the action of sulphureted hydrogen. It is insoluble in water and effervesces with hydrochloric acid, dissolving when heated, as chloride of lead, which crystallizes in needles on cooling. Dilute nitric acid easily dissolves white lead, with effervescence caused by the escape of carbonic acid gas. When heated on a knife or slip of glass it becomes yellow. It is not very generally known that white lead and oil combine with such energy that if linseed oil is poured upon a very large quantity of white lead, and the mass allowed to stand for a few hours, the temperature becomes so high that the oil is carbonized and colors the whole a black. We should carefully avoid mixing with white lead substances which may impair its brightness or depreciate its other qualities, and it should be kept in closed vessels, otherwise it will acquire a brown shade. For good paint it should be pure and without foreign mixture; however, both manufacturers and painters add to it variable proportions of chalk, sulphate of lead and the like, and it is often mixed with that sulphate of baryta which is called baryta white, and which is prepared from the native sulphate, or from carbonate of baryta artificially treated with sulphuric acid. Baryta white is an adulteration which ceases to be objectionable when the manufacturer makes the composition known, as it is of a handsome white color, entirely innocuous, fast and resisting most reagents; its great defect being that it possesses but little body or covering power. The manufacturers sell various qualities of white lead, sometimes in powder or in lumps, as genuine dry white lead, or flake white, but the greater portion in a paste, holding from 7 to 9 per cent. of oil. Krems, Nottingham and Newcastle whites are pure lead, differing only in the way in which they are made, Venice white is a mixture of equal parts of white lead and sulphate of baryta. Hamburg, Holland and other whites contain from 3 to 60 per cent. of sulphate of baryta, and inferior qualities large proportions of chalk. White lead paint is solid and durable, but the disagreeable vapors given off by the lead exercise a dangerous effect upon the health of the workmen who are engaged either upon its manufacture or its use.

Many substitutes have been tried to obviate the employment of white lead; zinc white in particular has received considerable attention, it has not such a bad effect upon the health, having no smell of itself, and does not impart any to the liquids with which it may be mixed, so that any place freshly painted with it may be at once inhabited without fear of its injuring the occupants. Zinc white is the oxide of zinc; it is insoluble in water, but dissolves in hydrochloric acid, usually effervescing slightly from the escape of carbonic acid, which oxide of zinc absorbs from the air. When heated, oxide of zinc becomes yellow, but resumes its white color on cooling. It is as brilliant, white and fine as white lead, and becomes on drying so hard that it will take a bright polish, it does not alter under the destructive action of sulphurous vapors, or of gas with equal weights; it covers a larger surface than carbonate of lead, but it is very dry under the brush, and therefore requires more labor in applying it, which, to a great, extent explains the disinclination to use it, spite of all the efforts made in its favor. It also takes longer in drying, and when adulterated is very liable to change color.

Red lead, so largely used by engineers, is an oxide of lead, usually in the form of a bright red powder, which is not affected by water, but evolves the smell of chlorine when boiled with hydrochloric acid, and is slowly converted into chloride of lead. Dilute nitric acid only partly dissolves it, leaving a brown powder. On account of its durability, it is frequently used as the priming coat, often the only coat given, on iron work. Care should be taken that no salt is present, otherwise a chemical action commences, blisters are formed, and the lead is reduced to the metallic condition. It has been proposed to substitute for red lead a red obtained from a sulphide of antimony, termed antimony vermillion, which is sold in a state of very fine powder, without taste or smell, and which is insoluble in water, alcohol or essential oils. It is but little acted on by acids, and foreign engineers state that when ground in oil it acquires great intensity or brightness of color, that it has a good body, is unalterable by air or light, and may be freely mixed with white lead. Black paints made from the residual products obtained in distilling coal and shale oils are largely employed for rough work. They combine readily with drying oils, and give an intense and handsome black, which is at the same time very economical. Native oxide of iron has of late years supplied us with a paint which possesses many of the good qualities of red lead without its inconveniences. Oxide of iron paints are most effective and durable paints to use on iron, as they have no tendency to change or affect the surface of the metal. An analysis of one of these paints gave—peroxide of iron, 68·95; aluminous earth (clay), 1·48; burnt clay, 29·57; total, 100·00. The purple-brown oxide is a hydrated peroxide of iron, Grant's black is made of shale containing iron, and the well-known Torbay paint is a protoxide of iron. Under equal volumes iron paints cover more than those from lead; mixed with one-third of white lead it forms an excellent mastic, similar to that made from red lead, and which becomes very hard after drying for some time. As the iron oxide paint resists a strong heat it is advantageously employed for painting parts of machines and boilers. The so-called anti-corrosive paint is made of equal parts by weight of whiting and white lead, with half the quantity of very fine sand or road dust, with colors at pleasure. The mixture being made with water can be used as a water color, but it is usually applied as an oil paint. The preparation of oil recommended for this purpose is 12 parts by weight of linseed oil raw, 1 part of boiled linseed oil, and 3 parts of sulphate of lime, the whole well mixed. One gallon of oil thus prepared is used to 7 lbs. of the paint. Paints containing silica have been used for both wood and metal; they give a hard surface, which is very durable; it is stated that when mixed with proper oils they will resist the action of salt water or acids better than iron or lead paints, that they cover well, and that in the case of wood they form a considerable protection against fire. In addition to the pigments mentioned, which are in themselves colors, various tints are produced by additions of ochres, earths naturally colored by iron; chromes or yellows, consisting of oxide of lead and chromic acid; blues, such as Prussian blue, from animal refuse burnt with potash and iron; smalts, from oxide of cobalt; ultramarine blue, from carbonate of soda, silica, alum, and sulphur; or greens, from oxides, carbonates, and arsenates of copper.

(To be continued.)

Manufacturing Charcoal.

A correspondent of the *Country Gentleman*, Simon Hunt, of Tolland county, Connecticut, gives a useful article on charcoal making:

The manufacture is not difficult; and one of good common sense will soon acquire the art without much instruction. The ground

selected for burning should be level, free from stones or other inequalities, reasonably near water, protected from high winds by hills or groves, but not shaded, as a good moon or starlight is a great convenience in burning. September and October are the best months to burn, as the days are not too hot nor the nights too cold.

Having selected the ground, the first thing is to cut and draw the wood, which can be most easily done in winter. Any kind of wood will answer, except that wood which is gummy or pitchy, or that holds fire long, is more difficult for a new hand. Cut and split the wood like cord wood, but the first tier may be five feet long. The blocks and pieces from saw logs will all work in on the top of the pit and make as good coal as any.

The wood should be seasoned as long as from winter to September. When ready to set up, make a box about four inches square as long as the hight of the pit. Two opposite sides should be pointed to stick into the ground in the center of the pit; the other two sides should not reach within one foot of the ground, care being taken to have the bottom of the box a trifle the largest (as the pit is fired in the center through this box), so that any coal or brand put in at the top is sure to go down and not lodge. When setting the wood, one or two men should hold the box in position, and for the first tier set the wood around the box, putting a few kindlings and light wood at the bottom.

When once started, put the largest end of the wood up, as the brands will then be smaller and less to reburn, and the bottom will then be looser and the top tighter, as they should be. Set each stick so if it stood alone it would fall toward the center, gradually drawing out the bottom, so that when done the pit is at an angle of nearly 45 degrees, so that the earth will lie on. When the first tier is well started, commence the second, if the pit is large, in the same way, only put the small end up, and with a little pains it will get the right slant. If the pit is small the second tier may be started nearly flat, putting the large end toward the center, with a few short pieces to start with. The small wood should be reserved for the outside, cutting it short and packing it close to prevent the covering of earth from rattling in.

When ready to burn, and the moon has just passed its first quarter, cover the pit with green coarse hay or weeds, cut while the dew is on, if convenient; if not, coarse dry litter will answer; then cover with earth six inches, leaving from four to six air holes at the bottom. In covering, commence at the bottom. When ready to fire, start a fire on the ground of hard wood; when burned to coals, drop a shovelful down through the box. When well started, having the wood and earth ready, fill the box with wood, driving it down with a pole, and cover the top with litter and earth. Keep the top tight so that the smoke will pass off at the air holes on the bottom.

If it burns too fast and blazes, which it ought not to after getting a start, give less air; if too slowly, more air. As it burns around the center first and shrinks, it must be fed or filled with wood, or the earth will not lie on. As smoke and steam rise, the fire is soon driven down to the lowest part of the pit, and will be drawn through to the outside, usually burning a narrow channel, and shrinking so that wood must be put on to keep the earth up. The fire will then work round until it has been over the whole pit, leaving brands from one to two feet or less. No process that I know of will induce the fire to burn longer. All that is necessary while burning is to regulate the draft and keep the pit tight by stamping and settling it down as it burns, and throwing on earth when required. While the pit is burning, the steam and smoke keep the covering moist; when burnt, the earth is dry like ashes, and one cannot walk upon it. As the fire in burning, reaches the outside, the fire-brands should be hauled out with a rake or hoe, and the fire smothered, by commencing at the bottom and taking out all bits of unburnt wood or litter, stones and sods raked out of the covering, the earth must be made fine and thrown back on to the pit; the pit smoothed over with a rake, and kept tight by throwing on earth, and raking, if fire or smoke appear.

When the whole pit has been in this condition about forty-eight hours, it is ready for commencing to draw the coal. This is done by shoveling in at the bottom, throwing the covering higher up on the pit; the brands are to be betten and thrown farther back, the coal raked from the earth and spread with iron rakes with long teeth. If any fire appears, put it out with water, using some convenient vessel with a small spout. The earth should be thrown back immediately; then rake the pit with a long tooth rake, bringing the pit to a slant of forty-five degrees, or as steep as the earth will lie on; when this spot is finished, move on, and so go round the pit. It is very important to keep the pit covered as much as possible in order to smother the fire. The brands are to be reburnt, setting them with the burnt end down. The coal should lie on the ground over night, and be closely watched, as it takes fire easily and burns rapidly. It takes from two to two and a half cords of wood to make one hundred bushels. To burn a pit of ten to twelve hundred bushels requires eight to ten or twelve days, according to a variety of circumstances.

Roman Aqueducts and Baths.

In a lecture lately delivered by Rev. H. G. Spaulding, in Boston, we find the following:

Rome was the city of fountains, formerly containing no less than 13,000, and has to-day nearly 700. The Roman aqueducts marked the transition in Rome from a mere village to a stately capital. The first one was built in 312 B. C., and called the Appian. It was almost subterranean, and extended nearly five miles outside the city. In 293 B. C. the Anio was constructed, and reached from springs in the Sabine Mountains to the city, a distance of 42 miles.

Most of the aqueducts entered the city near the Porta San Maria Maggiore. The Anio Novus and Claudian aqueducts were finished in 53 A. D., by Emperor Claudius, the length of the former being 62 miles. These two aqueducts united their channels in the Campagna, and to-day their picturesque ruins are seen extending for a distance of more than six miles over the desolate fields outside the Aurelian walls. When all the aqueducts were in operation in Rome (in the imperial epoch) the supply of water for the city must have been 50,000,000 cubic feet in 24 hours, more than ten times the actual supply of London for the same time. Thus can be seen how important was the water supply of Rome. The Romans of the republic had numerous swimming places owned by individuals, who charged an admission fee, as well as many private baths, before the great thermæ, or public baths for the whole body of citizens, were erected. The first thermæ were built by Agrippa, and others by Titus and Trajan, but the great thermæ were those of Caracalla and Diocletian. Those of Caracalla covered an area of 150,000 square yards, a space equal to Boston Common, and combined in one vast establishment such institutions as would answer to our libraries, reading rooms, lecture halls, base ball grounds, race courses and gymnasiums. There were seats for 1600 in the baths of Caracalla, and twice as many in those of Diocletian. The ruins of the former were more extensive and more impressive than any other ruins not excepting the Coloseum—in imperial Rome. Of the great thermæ of Diocletian, some of the spacious halls with vaulted ceilings were preserved in the churches of San Maria degli 'Angeli, designed by Michael Angelo, and San Bernado, which were built in those baths. In these half christianized edifices one is reminded of a remark of Taine that "Much of what is called christianity in Rome is only a thin veneering of christianity laid over the old paganism." The nymphæ were grottos of pleasure houses attached to the residences of wealthy Romans. The so-called "Grotto of Egeria," on which Byron wrote three of his elaborate verses, supposing it to be the veritable haunt of the Egeria of King Numa's time, is now ascertained to be merely a nymphæum belonging to a suburban villa.

Recent excavations have uncovered a station of the Roman Fire Bridge, a very interesting relic of old Rome. The Roman firemen were organized under Augustus, with a force of 12 cohorts of watchmen, each of 700 men. Their stations must have been palaces, judging from the building which has been exhumed, in which the rooms were gracefully ornamented, and the courts richly paved.

In presenting views of the excavations now progressing so slowly in the baths of Caracalla, the lecturer suggested that the citizens of Boston or of Massachusetts, who valued so highly even a fragment of statuary from old Rome, should make an offer to the Italian government to excavate these ruins, receiving as compensation the spoils that were no doubt buried under the debris, and thus by infusing a little Yankee energy into the excavation, confer a benefit upon the world as well as ourselves.

An Austrian manufactory has made 180,000 rifles for the Prussian government, and is making 145,000 more.

The "Twin" Hose Pipe is the only combination nozzle with direct water way, and the only one giving permanent satisfaction. Made only by S. J. WHEELER, 56 Lake St., Chicago. Price $2.50. Sample mailed free on receipt of price. Liberal discount to the trade.

BOOMER & BOSCHERT PRESS CO.

Syracuse, N. Y., & 26 Beekman St., N. Y. City.

For Cider, Wine, Hay, Lard, Tallow, Paper, Cotton, Seed Oil, *and other purposes which require great pressure is required.*

☞ Send for Circulars.

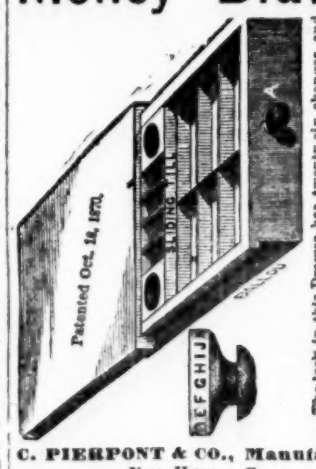
Manhattan Fire Brick & Enameled Clay Retort Works,

ADAM WEBER, - - Proprietor.

Office, 633 E. 15th St., N. Y. Clay Retorts, Enameled for Gas Houses; Retorts for burning raw bone and re-burning bone for Bone Black. Fire Bricks, Flues, Blocks, Cupola and Range Bricks of all shapes and sizes. The best fire clay from my own Clay Beds at Perth Amboy, N. J.

EXCELSIOR

Money Drawer.



The lock in this Drawer has twenty-six changes, and is so constructed that an unauthorized person cannot open it. The proprietor can change the letter, and all former knowledge is rendered useless to outside parties.

C. PIERPONT & CO., Manufacturers,

New Haven, Conn.

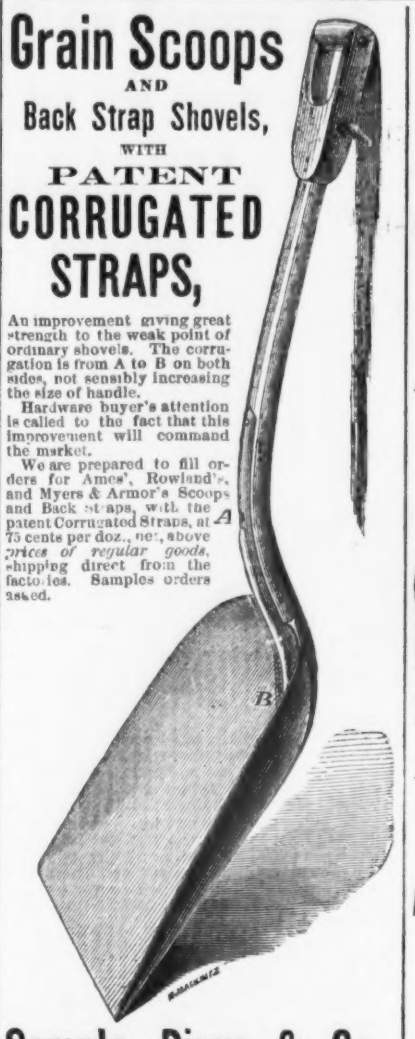
Semple, Birge & Co., General Western Agents, 13 S. Main St., St. Louis, Mo.

Grain Scoops AND Back Strap Shovels, WITH PATENT CORRUGATED STRAPS,

An improvement giving great strength to the weak point of ordinary shovels. The corrugation is from A to B on both sides, not sensibly increasing the size of handle.

Hardware buyer's attention is called to the fact that this improvement will command the market.

We are prepared to fill orders for Ames', Rowland's, and Myers & Armor's Scoops and Back Straps, with the patent Corrugated Straps, at 75 cents per doz., net, above *prices of regular goods*, shipping direct from the factories. Samples orders asked.



Semple, Birge & Co.,

13 South Main St., ST. LOUIS, MO.

Sole Western Agents.

The Livingston Horse Nail Co.,

95 Reade Street, NEW YORK.

Sole Eastern Agents.

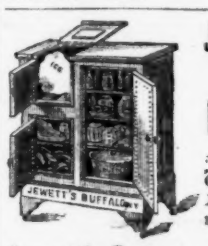
Designing & Engraving ON WOOD.

Done in the best manner at the office of *The Iron Age* and *The Metal Worker*,

10 Warren Street, New York.

Estimates given for Catalogues, Posters, &c.

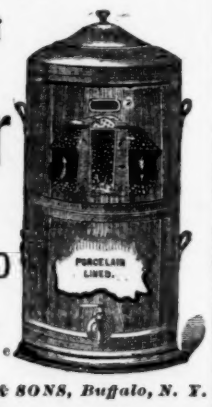
Isaac F. Eaton. *Geo. B. Collins.*



Jewett's Patent PALACE Refrigerator.

Pronounced the most Convenient and Perfect *Family Refrigerator* made.

Jewett's Patent WATER Filter WITH PORCELAIN LINED COOLER.

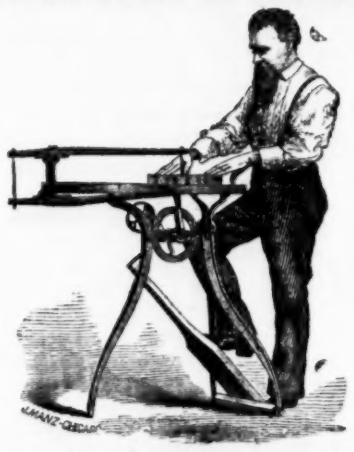


Send for Circulars to e only Manufacturers

JOHN C. JEWETT & SONS, Buffalo, N. Y.

BARNES' FOOT POWER

Scroll Saws & Lathes.



Send for Catalogue. Terms net cash.

M. D. CONVERSE & CO.,

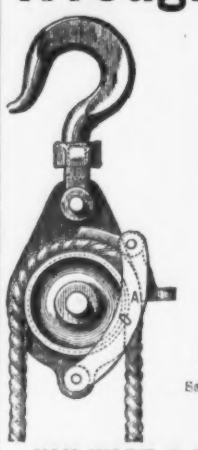
68 Park Place, N. Y.

Stretches the wire each way, is tightened with a common wrench, is self-fastening at each half turn of the spindle. Warranted for strength and durability. Sold at hardware stores generally. Byington & Northup, sole manufacturers, Rochelle, Illinois.

Agents: Hibbard & Spencer, Chicago; Excelsior Mfg. Co., St. Louis; John Nazro & Co., Milwaukee; George Tritch Denver; Nelson & Co., Burlington, Iowa.

Wrought Iron Tackle Blocks,

FOR ROPE OR CHAIN.



Weston's Patent RATCHET DRILL.

Style "A" Six Sizes.

Five other styles made, all wrought iron.

Patent Self-Sustaining Rope Pulley Blocks.

Same as the ordinary block, but suspends the weight at any point.

Weston's Patent Differential Pulley Blocks.

Made from ½ ton size to 10 tons.

VAN WART & McCOY, Sole Agents, 134 & 136 Duane St., N. Y.

The Celebrated DUBUQUE.

Acknowledged by all to be the Standard Soft Coal Burner of the West.

1. It is all cast iron—simple in its construction, and no machinery to get out of order. 2. It is a perfect gas and smoke burner. 3. It is the most powerful heater. 4. The fire is under perfect control at all times. 5. It combines the revertible flues and exposed fire chamber, and clinkerless grate. 6. It ventilates the room perfectly. 7. No dust or ashes escape into the room while managing it. 8. Has shaking and dumping grate with ash drawer. 9. The fire-pot being exposed to the cold air and made in two parts will outlast any in use. 10. The fire will keep from 20 to 30 hours without replenishing. 11. The parts directly exposed to the fuel can be replaced with but little trouble and expense. 12. Its operation is perfect with the poorest coal found in the West. 13. All parts of the base are heated perfectly. 14. Its beauty of design gains for it admission into any parlor. 15. It is especially adapted for the use of a Tea-kettle, from which boiling water can be had in a few moments.

The Manufacturers have made it a specialty for the past seven years. It is guaranteed in every respect to be a perfect Soft Coal Burner and without a rival. Send for Samples and Catalogues to

BURDETT, SMITH & CO.,

253 River St., Troy, N. Y.

62 Lake St., Chicago, Ills.

Pomeroy, Peckover & Co.,

Cincinnati, O.

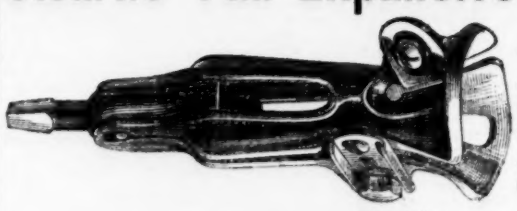
Benjamin Fisher,

Wheeling, W. Va.

John G. Rollins & Co.,

Old Swan Wharf, London, Eng.

Stearns' Pat. Expansive Fore Auger.



A new invention for trimming down a spoke before using the Hollow Auger, effecting a saving of one half the labor, by the knife cutting at an angle more with the grain of the spoke, than the Hollow Auger.

It is particularly adapted to heavy work, cutting any size up to inch and a half.

For sale by

G. N. STEARNS & CO., Syracuse, N. Y.

EMPIRE IRON CLAD PAINT COMPANY,

Manufacturers of and Dealers in

The Finest, Most Durable, Best and Cheapest, Ship, Rail Road, and Roofing Paint in the World.

Manufactured under Green's Patent.

30 West Broadway, Near Duane St., NEW YORK.

PURE IRON ORE PAINT.

FOUNDRY FACING CO.,

Miners and Manufacturers of Walsh's

Celebrated XX Mineral Facings

And Dealers in FOUNDRY SUPPLIES.

P. O. Box, 4536.

191 Chambers Street, NEW YORK.

AMES' GENUINE CHESTER EMERY

has been reduced from 7c. to 6c. per lb. for grains in kegs. Flour and Fine Flour remaining at 4c. per lb., as heretofore. Important discounts to the trade.

Send for Circulars.

E. V. HAUGHWOUT & CO.,

96 Beekman Street, New York.

WILSON BOHANNAN,

Manufacturer of Patent

Brass Spring PAD LOCKS.

Improved Flat Steel Key Pad Locks.

Passenger Car Locks, Bronze, Nickel Plated and Japanned.

For Railroad Switches, Freight Cars, &c.

Cor. Broadway & Kosciusko Street, Brooklyn, E. D., N. Y.

STANDARD
32 Cal.
Just Out.

Prices Reduced for Little Joker, STANDARD, Paragon, Tycoon & Whitney's Revolvers.

ILLUSTRATED CATALOGUE of

GUNS, RIFLES, PISTOLS, MATERIAL,

Shooting Tackle, &c., furnished to DEALERS only.

P. O. Box 5380. SCHOVERLING & DALY, 84 and 86 Chambers Street, N. Y.

HERCULES IRON CUTTER.

No. 1, weight	16 lbs.,	cuts	¾x2	inch, or	½	inch round or square		Price	$25 00
No. 2, "	165	"	⅞x3	"	⅝	"	"	"	50 00
No. 3, "	350	"	¾x4	"	1	"	"	"	75 00

This is by far the most powerful Iron Cutter in use which can be worked by hand, having three times the capacity of any other machine which sells at the same price. The No. 3 machine occupies a space of 12x30 inches; when in use additional space must be had for the lever to work in. We send two sets of knives with each machine—one for square and flat, the other for round iron and steel. By using the knives adapted to it, round iron is cut without being flattened. One man can cut the largest size iron named above, but two would be required for steady work. It does not take a minute to change the knives or to shift the machine from large to small sizes.

AUGUSTA, GA., March 3, 1875.

MILLERS FALLS CO.—Enclosed find draft for amount of invoice, January 7. We would have sent the amount before, but did not have an opportunity of trying the Iron Cutter until a few days ago. It is one of the best machines we ever saw. Yours, truly, MOORE & CO.

Office of the ATHENS FOUNDRY AND MACHINE WORKS,
ATHENS, GA., February 18, 1875.

H. L. PRATT, President.—Dear Sir: Enclosed find draft made payable to your order by Messrs. Childs, Nickerson & Co., in payment for Iron Cutter. We have put our Cutter to good service, and find it cuts readily 1⅛ round, and 3½ x ⅝ square iron. C., N. & Co. are pleased with theirs, say it will save many a blow and cold chisel in their iron house.

Truly, yours, R. NICKERSON, Agent.

We make a satisfactory discount to dealers, and warrant the cutters to do all which we claim for them. Send for prices.

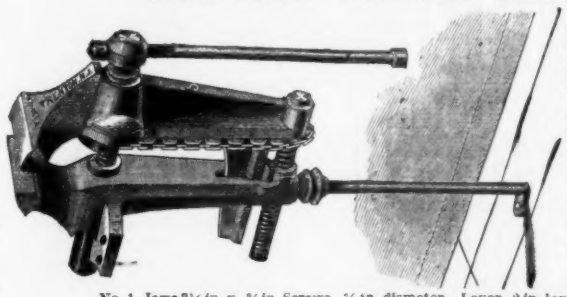
Millers Falls Company,

No. 78 Beekman Street, New York,

Sole Proprietors and Manufacturers of the

Barber Self-Fitting Bit Braces, Millers Falls Vises,
Improved Angular and Ratchet Drilling Machines,
TUBE SCRAPERS, FAMILY TOOL CHESTS,
Patent Adjustable Tool Holders, Mitre Boxes, Ratchet Braces, Breast Drills, etc.

The New Double Screw Parallel "Leg" Vise.



We are now ready to furnish, as the result of more than thirty years' experience, our latest style of Vise—the best yet made. It is **stronger** than any other, whether of Foreign or of American make; always parallel and holding with a tighter "grip." The jaws are of convenient shape for the workman to get near his work equally well for filing or chipping. Instead of the heavy, clumsily formed jaws of the cast iron Single Screw Vises of the common "parallel" type, and which, depending upon slides alone for preserving parallelism, can never be screwed up very hard without "jamming" on the sides or breaking.

Our New Vise combines all the advantages of the "Peter Wright" Leg Vise, of strength and lightness, fastening to the floor and bench, and at the same time greatly superior to it; is always perfectly parallel at all points of opening, and never gets out of line. Embodying the same general principle as the well known Chain Vise, so long made by us, we have by new, scientific proportioning of all the parts, and with our recently improved metals for their manufacture, obtained so perfect a tool, that we now *warrant* these Vises for *three years* from date of manufacture stamped upon each.

The Jaws are of best Tool Cast Steel, welded on, file cut and properly hardened. The screws are forged of the best refined iron, and work in *solid cut thread* boxes.

The lower screw maintains the parallel position of the two jaws, by having exact motion with the upper working screw through the connecting chain which regulates it.

The chain is very accurately made of steeled links and rivets, and having no strain of the work upon it, is therefore as durable as all the other parts.

Prices with Special Discounts to the Trade.

No. 1,	Jaws	3½	in. x	⅝	in.	Screws	¼	in. diameter.	Lever 9 in. long, Opens 4½ in. $8 00
" 2,	"	4½	in. x	1	in.	"	1⅛	in.	" " 13 in. " " 5¼ in. 12 00
" 3,	"	5¼	in. x	1⅛	in.	"	1¼	in.	" " 16 in. " " 6½ in. 17 00
" 4,	"	6¼	in. x	1¼	in.	"	1½	in.	" " 19 in. " " 7½ in. 22 00
" 5,	"	7	in. x	1½	in.	"	1⅝	in.	" " 24 in. " " 9 in. 30 00
" 6,	"	8	in. x	1½	in.	"	1⅝	in.	" " 28 in. " " 10 in. 34 00

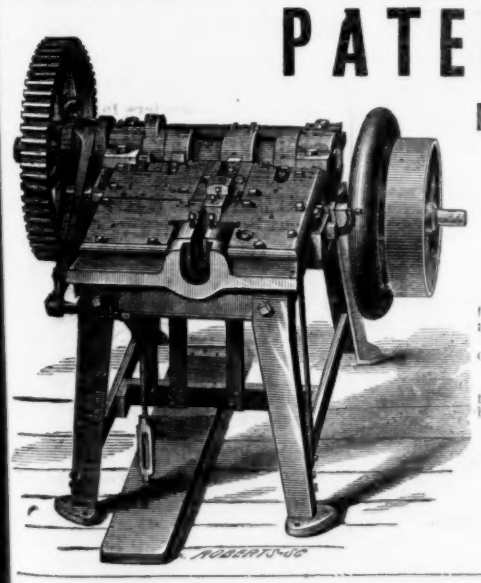
All sizes of these Vises furnished with Swivel Attachment, at an additional cost of $1 to $3. Sold at the General Agencies.

THESE GOODS ARE SOLD BY THE GENERAL AGENTS (with special discounts to the trade).

New York.—Messrs. J. CLARK WILSON & CO.—RUSSELL & ERWIN MANUFACTURING COMPANY.—Messrs. HORACE DURRIE & CO. Boston.—Messrs. GEORGE H. GRAY & DANFORTH. Philadelphia.—Messrs. JAMES C. HAND & CO. Baltimore.—Mr. W. H. COLE.

FISHER & NORRIS, Trenton, N. J.

PATENT BOLT HEADER



Every Railroad Shop, Car Shop, Machine & Bolt Shop, Mower, Reaper & Plow Manufacturer, should have one.

Three sizes of these machines are made, viz:

No 1	will make bolts from	½	inch down.
No. 2	"	⅝	"
No. 3	"	1⅛	"

The three sizes if run together would require from 2 to 2½ horse-power.

The variety of shapes that can be made are only limited by the ingenuity of the owner. A few minutes only are required to make a change from one shape or size to another. All dies are made of the best Cast Steel, and can be redressed many times.

T. Button, Countersunk, Rivet and Round Head; Plow and Track Bolts, &c., are made at one revolution. Square and Hexagon Heads require from 3 to 5 revolutions.

For Simplicity, Durability and Compactness it has no equal.

A Boy can learn to run it in a few hours. The bolt is made on the heated bar and cut off in the machine to any length from 1 to 10 inches; if greater lengths are desired, they should be cut before heating. Either Round or Square Iron may be used.

Will use up as much iron as can be heated in any ordinary blast fire.

For prices and further particulars, address,

WILLIAM GARDNER'S SONS,

575 Grand & 414 Madison Sts., N. Y.

OLIVER'S CHILLED PLOWS.

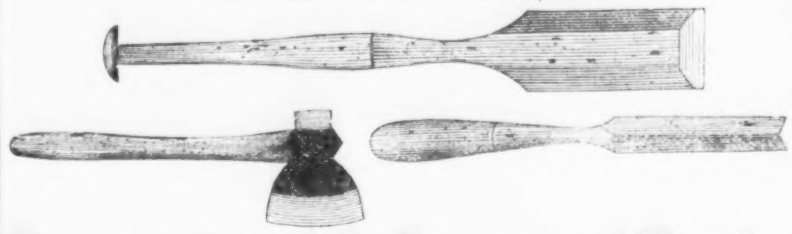
These implements, though but four years before the public in their present form, show the following remarkable record:

506 were sold in the season of 1871. 7472 were sold in the season of 1873. 30,000 will be made for the season of 1875.
949 " " " 1872. 14,976 " " " 1874. For full descriptive circulars, address,

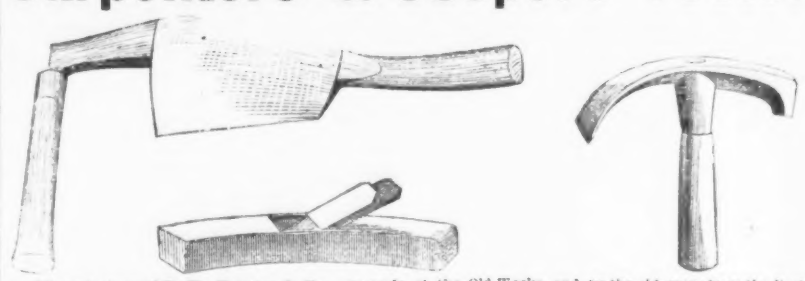
SOUTH BEND IRON WORKS, South Bend, Ind.

MACK & CO.

Successors to
D. R. BARTON & CO.,
At the Old Stand, 136 Mill St., ROCHESTER, N. Y.
Sole Manufacturers of the
D. R. BARTON & CO. BRAND OF



Carpenters' & Coopers' Tools.



All goods stamped **D. R. Barton & Co.**, are made at the Old Works, and by the old men, from the best English Steel, manufactured for by us by Thos. Firth & Sons and Wm. Jessop & Sons, and fully warranted.

Goods stamped **D. R. Barton** are not made at the Old Works of the company, but by a new stock company, formed about the time of Mr. Barton's decease.

TRADE MARK D. R. BARTON, 1832. ROCHESTER, N. Y. REGISTERED.

ONLY GENUINE
"D. R. Barton" Edge Tools,

Manufactured by
D. R. BARTON TOOL CO.,
Cor. Mill and Furnace Sts.,
ROCHESTER, N. Y.
CHARLES C. BARTON, President.

Goods Stamped "D. R. BARTON & CO." are neither Made, Sold nor Warranted by us.

C. W. PACKER'S

PATENT

ICE CREAM FREEZERS.

These Freezers have been in use since 1860 with the most flattering results, and they have well earned the reputation of being the BEST ICE CREAM FREEZER ever introduced, and have been awarded the highest premiums. No expense is spared to render them perfect, improvements being constantly introduced in their manufacture; they are simple in their construction, containing no complicated machinery, are not liable to get out of order, and perfect in operation. They are made in the most durable and substantial manner, none but the best materials are used in their construction, and the mechanical arrangements are such that they will freeze Cream, Fruits or Water Ices in the shortest possible time.

DOUBLE ACTION FREEZER.

SIZES AND PRICES.

10 quarts					$15·00
15 "		$20·00—	With Fly Wheel		25·00
25 "		25·00—	"	"	30·00
35 "			"	"	40·00

COG WHEEL FREEZER.

SIZES AND PRICES.

2 quarts	$3·50	8 quarts	$ 9·00		
3 "	4·50	10 "	12·00		
4 "	5·50	15 "	15·00		
6 "	7·00				

For sale in New York at minimum rates by Wholesale Dealers in House Furnishing Goods generally.

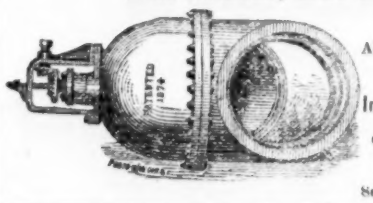
CHARLES W. PACKER, Manufacturer, Philadelphia.

Armstrong & Hutchinson,

Manufacturers of

PATENT STOP GATES

For Water, Gas and Steam,

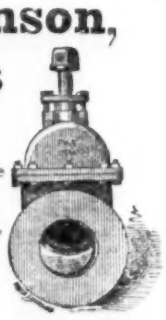


From 2 in. to 50 in. diameter.

Also, **Fire Hydrants, Single and Double Nozzle.**

Improved Boiler Feeders, Etc.

Cor. Park Way & Sandusky Sts., ALLEGHENY, PA.



Send for Circular.

MAGENS & CO.,

73 Third Street, Louisville, Ky.

Representing MORRIS, TASKER & CO., Philadelphia, Pa.

Manufacturers of

Wrought Iron Pipe, Lap Welded Boiler Tubes, Gas and Steam Fitters' MATERIALS of all kinds.

Agents for **Blake Steam Pump, Shive Governor, Utica Steam Gauge** and **Keystone Portable Forge.** We handle **only** M., T. & Co.'s Tube, which we guarantee to be of **standard weight.** Every length stamped with the trade mark of M., T. & Co. Send for Catalogue and Prices.

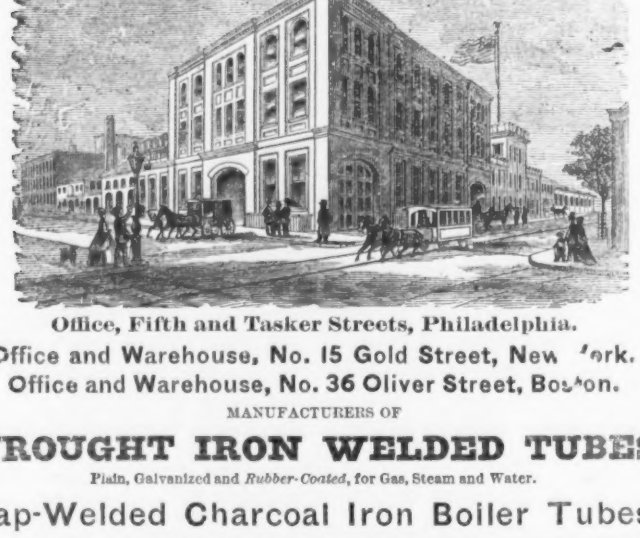
Pipe, Fittings, &c.

Thomas T. Tasker, Jr. Stephen P. M. Tasker

MORRIS, TASKER & CO.,

PASCAL IRON WORKS, Philadelphia,

TASKER IRON WORKS, New Castle, Del.,



Office, Fifth and Tasker Streets, Philadelphia.

Office and Warehouse, No. 15 Gold Street, New York.

Office and Warehouse, No. 36 Oliver Street, Boston.

MANUFACTURERS OF

WROUGHT IRON WELDED TUBES,

Plain, Galvanized and *Rubber-Coated*, for Gas, Steam and Water.

Lap-Welded Charcoal Iron Boiler Tubes.

Oil Well Tubing and Casing, Gas and Steam Fittings, Brass and Steam Fitters' Tools, Cast Iron Gas and Water Pipe, Street Lamp Posts and Lanterns, Improved Coal-Gas Apparatus, Improved Sugar Machinery, Etc.

BAILEY'S PATENT ADJUSTABLE PLANES.

IRON AND WOOD. 30 different styles.. 90,000 ALREADY IN USE.

Smooth Planes,
Jack Planes,
Fore Planes,
Jointer Planes,
Block Planes,
Rabbet Planes,
Circular Planes.

Carpenters,
Cabinet Makers,
Car Builders,
Carriage Makers,
Millwrights,
Wheelwrights,
All Use them

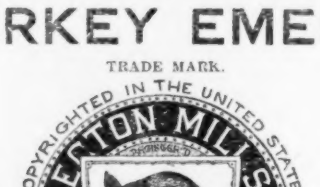
[No. 9½ Excelsior Block Plane, $2 00.]

Manufactured by the **STANLEY RULE & LEVEL CO.,**

Factories: New Britain, Conn. Warerooms: 35 Chambers Street, New York.

Ecton Mills Genuine London TURKEY EMERY.

TRADE MARK.



ABBOTT & HOWARD, Agents for the United States.

81 John Street, New York. 35 Oliver Street, Boston.

EATON, COLE & BURNHAM CO.,

58 John Street, New York.

MANUFACTURERS OF

Wrought Iron **PIPE,** Cast Iron FLANGED PIPE, **Cast Iron** RADIATORS and BOILERS.

Brass & Iron **STEAM** Gas & Water FITTINGS. PLUMBERS' MATERIALS.

STEAM GAUGES, TOOLS,

And all Supplies used by Machinists, &c.

TRADE MARK

PAGE'S PATENT MAY. 8. 1866.

HOUSE ESTABLISHED, 1862.

GEORGE S. FALES,

SUCCESSOR TO

FAIRBROTHER & FALES

Sole Owner and Manufacturer of

Page's Patent Lace Leather,

And Manufacturer of

OAK BELTING,

Also, Picker or Moccasin Leather, for Boot and Shoe Packs.

Angular Belting and Pullies made to order.

PAWTUCKET, R. I.

Ask for Star Stamped Lace Leather.

New Patent "X" Razor Strap.

PATENTED DECEMBER 23, 1873.

This Strap, designated on our List as Letter "X," is of novel construction—is elastic, pleasantly folding to the razor—gives a keen fine edge—is made of superior stock—is furnished at a low price—**and gives universal satisfaction.**

☞ **ITS PRICE SELLS IT.** ☜

BENJAMIN F. BADGER, Sole Manufacturer,

Badger Place, Charlestown Mass.

Pipe, Fittings, &c.

WROUGHT IRON

INDESTRUCTIBLE ENAMELED PIPE

For Water, Gas, Sewage & Soil Pipe.

Manufactured Solely by

NATIONAL TUBE WORKS CO.,

Also Lap Welded Steam & Gas Pipe & Boiler Tubes.

Tubing & Casing for Artesian, Oil & Salt Wells (with Patent Protecting Coupling),

A Specialty made of Large Wrought Iron Lap Welded Tubes, 8 in. to 14 in. diameter.

MACK'S PATENT INJECTOR, ETC.

Works and Offices at BOSTON, MASS., and McKEESPORT, PENN.

OFFICES AND WAREHOUSES,

New York, 78 William Street. | Chicago, 112, 114 & 116 Lake Street.
Buffalo, 216 Main Street. | Cincinnati, 119, 121 & 124 Pearl Street.

McNab & Harlin Mfg. Co.,

MANUFACTURERS OF

BRASS COCKS

For STEAM, WATER and GAS.

Wrought Iron Pipe & Fittings, Plain and Galvanized

PLUMBERS' MATERIALS.

Illustrated Catalogue sent by express to the Trade on application.

Factory, Paterson, N. J. 56 John Street, N. Y.

PANCOAST & MAULE

227 Pear St.

PHILADELPHIA.

WROUGHT IRON PIPE

FITTINGS, BRASS & IRON VALVES & COCKS

TOOLS & STEAM FITTERS SUPPLIES &c.

PIPE CUT & FITTED TO PLANS FOR MILLS &c.

CONTRACTORS

FOR HIGH & LOW PRESSURE STEAM HEATING APPARATUS FOR ALL CLASSES OF BUILDINGS.

Send for Illustrated Catalogue.

WM. ESTERBROOK,

Wholesale Manufacturer of

Coal Hods,

FIRE SHOVELS, Etc.

311 Cherry St., PHILADELPHIA.

CAST IRON PIPES

FOR WATER AND GAS.

Branches Retorts, &c.

Warren Foundry & Machine Co.,

PHILLIPSBURG NEW JERSEY.

R. D. WOOD & CO.,

Philadelphia,

Manufacturers of

Cast Iron Pipe

FOR WATER AND GAS.

Lamp Posts, Valves, &c.,

Mathew's Pat. Anti-Freezing Hydrants.

400 CHESTNUT STREET.

GEORGE BARNES & CO.,

Manufacturers, Syracuse, N. Y.

ENCAUSTIC TILES.

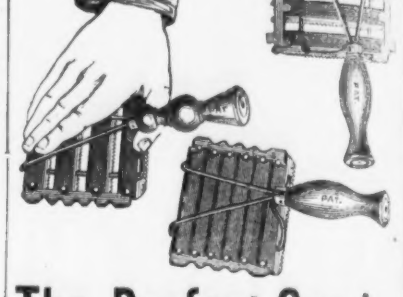
ALEXANDER FINDLAY,

Importer.

99 MAIDEN LANE, N. Y.

Sole Agent in the U. S. for

CRAVEN, DUNNILL & CO., (Limited.)



The Perfect Comb.

We call your attention specially to our new patent endless wire frame comb. The result of a long series of experiments, made with a view to meeting all the requirements of a *Perfect Comb*. It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the horse while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when clasped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: **The Perfect Comb.**

THE LAWRENCE COMB CO.

Factory and Office,

382 2d Ave., cor. 22d St., N. Y.

WILLIAMS WHITE & CHURCHILL

Successors to

MACKRELL & RICHARDSON MFG. COMPANY

Manufacturers of

Builders' Hardware,

Locks, Hinges, Hooks and Staples,

Awning Hooks, Meat Hooks, Pincers,

Champion Noiseless Pulleys,

CHAIN PULLEYS &c.

Factory, cor. Flushing and Nostrand Avenues BROOKLYN.

Warehouse, 73 Warren St., N. Y.

WM. S. CARR & CO.

Sole Manufacturers of

CARR'S

Patent Water Closets,

PUMPS,

Cabinet Wood Work, Vases, &c

106, 108 & 110 Centre Street,

Factory, Mott Haven, New York.

J. AUSTIN & CO.,

168 Fulton Street, N. Y.,

Proprietors and Manufacturers of

WHEATCROFT'S SELF-ADJUSTING

Pipe Wrench,

AND

Scripture's Funnel Top

MACHINE OILERS.

Dealers in

STEAM AND GAS FITTERS TOOLS.

RIEHLE BROTHERS,

Ninth Street, near Coates, Philadelphia.

New York Store, 93 Liberty Street.

Pittsburgh Store, 285 Liberty Street

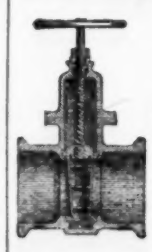
"Patented" Furnace Charging Scale.

Double Beam R. R. Track Scale, Compound Parallel Crane Beams, &c. Patented First Power Lever Wagon Scales. Testing Machines any capacity.

Chapman Valve Mfg. Co.,

STEAM VALVES,

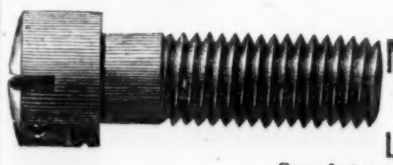
Iron and Composition, of all sizes.



WATER and GAS Gates, 3 to 48 inches

HYDRANTS.

Office and Warehouse, 75 & 77 Kilby St., Boston, Mass.



TURNED

MACHINE SCREWS.

One-sixteenth to five-eighths diameter.
Heads and points to sample.

IRON, STEEL and BRASS.

Lyon & Fellows Mfg. Co.,

Cor. 1st and North 3d Streets, Williamsburgh, N.

The Iron Age Directory

and Index to Advertisements.

PAGE.

Adjustable Stencil.
Hale B. E., 56 and 58 Park Place, N. Y.....24

Alarm Whistles and Speaking Tubes.
Ostrander W. E., 19 Ann, N. Y.....11

Agricultural Steels and Irons, etc., *Makers of.*
Kellis, A. J. & Co., Pittsburgh, Pa.....4

Alarm Tills.
Tucker & Dorsey, Indianapolis, Ind.....37

Anvils, *Manufacturers of.*
Fisher & Norris, Trenton, N. J.....23

Augers, Bits, etc., *Manufacturers of.*
Shattuck W. F. & Co., 113 Chambers, N. Y.....8
Stearns G. N. & Co., Syracuse, N. Y.....24

Axes, Edge Tools, &c., *Manufacturers of.*
Francis Axe Co., Buffalo, N. Y.....31
Jones, M. H. Cohoes N. Y.....32

Axles, Springs, etc., *Manufacturers of.*
Brown D. Arthur & Co., Fisherville, Concord, N. H...33
Clark Smith & Co., Fort Plain, N. Y.....32
Semple, Birge & Co., St. Louis, Mo.....3
Buck Bros., Millbury, Mass.....11

Coal, *Miners of.*
Parker A. & Co., 111 Broadway, N. Y.....18

Coal Vases.
Sidney Shepard & Co., Buffalo, N. Y.....31

Coal Hods, *Manufacturers of.*
Easterbrook Wm., 311 Cherry, Phila.....26
Smith, Burns & Co., 46 Cliff, N. Y.....34

Coffee and Spice Mills.
Lane Brothers, Millbrook, N. Y.....18
Enterprise Mfg. Co., Philadelphia, Pa.....34

Commission Merchants, *English.*
Goddard Samuel A. & Co., Birmingham, Eng.....2

Compasses and Dividers, *Manufacturers of.*
Bemis & Call Hardw. & Tool Co., Springfield, Mass..8

Cooper's Tools, etc., *Dealers in.*
Little Chas. E., 59 Fulton N. Y.....3

Crucibles, *Manufacturers of.*
Newkumet Adam, 1537 N. Front, Phila.....37
Straw, Wile & Co., 709 Market, Phila.....35
Taylor Robert & Co., 1900 to 1906 Callowhill, Phila...35

Curry Combs. *Manufacturers of.*
Lawrence Curry Comb Co., 382 2d Avenue, N. Y.....25

Cutlery, *Importers of.*
Boker Hermann & Co., 101 Duane, N. Y.....32
Asher Jos. S., 411 Commerce, Phila.....11
Friedmann & Lauteriung, 14 Warren, N. Y.....1
Kinz, Briggs & Co., 80 Chambers, N. Y.....17
Peace Chas. Jr., 82 Chambers, N. Y.....11
Ward Asline, 101 Duane, N. Y.....11
Wilson Hawksworth, Ellison & Co., 72 John, N. Y...36

Cutlery, *Manufacturers of.*
Barnaby Aaron, Pepperell, Mass.....11
Furness, Bannister & Co., Newark, N. J.....11
John Russell Cutlery Co., Turners Falls, Mass.....11
Meriden Cutlery Co., 49 Chambers, N. Y.....11
Miller Bros. Cutlery Co., W. Meriden, Conn.....11
Northampton Cutlery Co., 45 Murray, N. Y.....11
New York Knife Co., Walden, N. Y.....11
Woods Cutlery Co., Antrim, N. H.....11

Diamond Tools.
Dickinson J., 61 Nassau, N. Y.....32

Dog Muzzles.
Merserean W. T. & J., 62 Duane, N. Y.....10

Door Alarm. *Makers of.*
F. Blakemore, 3452 Market, Philadelphia.....3

Door and Gate Springs.
Quackenbush, Townsend & Co., 59 Reade, N. Y.....31
Van Wagoner & Williams, 82 Beekman, N. Y.....40

Dredging, *and Makers of Dredging Machines.*
Am. Dredging Co., 19 S. Delaware ave., Phila.....30

Drill Chucks. *Manufacturers of.*
Lambertville Iron Works, Lambertville, N. J.....34

Drilling Machines. *Makers of.*
Thorne & DeHaven, Philadelphia.....28

Drop Forgings.
Billings & Spencer Co., Hartford, Ct.....16
Hammond B. & Co., Hartford, Conn.....8
The Hull & Belden Co., Danbury, Conn.....

Edge Tools, *Makers of.*
D. R. Barton Tool Co., Rochester, N. Y.....25
Mack & Co., Rochester, N. Y.....25
Weed N., 4 Gold, N. Y.....18

Elevators. *Makers of.*
Crane Bros. Mfg. Co., Chicago, Ill.....40
Holske Machine Co., 279 Cherry, N. Y.....35
Whittier Machine Co., 1176 Tremont, Boston, Mass..35
Otis Bros. & Co., 348 Broadway, N. Y.....9

Emery.
Abbott & Howard, New York and Boston.....26
Gray Geo. H. & Danforth, Boston, Mass.....16
The Union Stone Co., 6 Exchange, Boston.....32

Emery Cloth.
The Union Stone Co., 6 Exchange, Boston.....32

Emery Wheels, *Makers of.*
Am. Twist Drill Co., Woonsocket, R. I.....32
Lehigh Valley Emery Wheel Co., Wilessport, Pa.....3
The Union Stone Co., 6 Exchange, Boston.....32

Ladies' Lever Busts and Weight Movers.
Remy Truck Co., Baltimore, Md.....34

Enamelled Tiles, *Importer of.*
Findley Alex., 99 Malden Lane, N. Y.....26

Engineers, Machinists, etc.
Bensaud James, 1056 Beach, Phila.....28
Moore James, cor. 16th and Buttonwood, Phila.....35

Engines, Steam, *Makers of.*
Baird & Huston, Philadelphia, Pa.....9
Hartford Foundry and Machine Co., Hartford, Ct...30
Shapley & Wells, Binghamton, N. Y.....24
Utica Steam Engine Co., Utica, N. Y.....30
Woodruff Iron Works, Hartford, Conn.....28

Engravers & Designers on Wood.
Eaton & Collins, 10 Warren, N. Y.....24

Faucets, Brass, *Makers of.*
McNab & Harlin Mfg. Co., 36 John, N. Y.....23

Faucets, *Self-Measuring, Makers of.*
Enterprise Mfg. Co., of Pa., Phila. and N. Y.....34

Files, *Importers of.*
Carr J. & Riley 82 John, N. Y.....36
Heuer Joseph S., 411 Commerce, Phila.....11
Pease Peter A. & Co., 25 Fulton, N. Y.....8
Moss F. W., 80 John, N. Y.....36
Stimpson Bros. & Co., 16 Cliff, N. Y.....36
Sykes & Jackson, 116 Duane, N. Y.....31

Files, *Manufacturers of.*
Adamantine File Works, Providence, R. I.....18
American File Co., Pawtucket, R. I.....5
Auburn File Works, Auburn, N. Y.....6
Barnett G. & H. 41 and 43 Richmond, Phila.....9
Heller L. B. & Co. Newark N. J.....8
Miller & Bros. Newark, N. J.....8
Risdon File Mfg. Co., Lowell, Mass.....18
McCaffrey & Bro., 1732 and 1734 N. 4th, Phila.....
Nicholson File Co., Providence, R. I.....28
Nassier, Clemson & Co., Middletown, N. Y.....10
Welsh, Coulter & Flazier, 83 Chambers, N. Y.....8
Western File Works, Beaver Falls, Pa.....8

Fire Brick, *Makers of.*
Brooklyn Clay Retort and Fire Brick Works, Van Dyke, St., Brooklyn, N. Y.....27
Hall A. & Sons, Perth Amboy, N. J.....27
Hall A. & Sons, Buffalo, N. Y.....27
Harbison & Walker, Pittsburgh, Pa.....27
Harrison & Mable, Peekskill, N. Y.....27
Herscher S. & Son, 58 Goerck, N. Y.....27
Miller S. P., 309 S. 5th, Philadelphia.....27
Newkumet Philip, 23d and Vine, Phila.....27
Newton & Co., Albany, N. Y.....27
Newkumet Adam, 1537 E. 15th, N. Y.....27
Pease Thomas C. le.....
Perley A. B. & Son, 503 and 505 Commerce, Phila...3

Flint and Emery Paper and Cloth.
Baeder, Adamson & Co., 720 Market, Phila.....11

Fluor Spar.
Schweitzer Mfg. Co., 57 Reade, N. Y.....5

Fluting Machines, *Makers of.*
Sommer Henry, 8 to 12 Pearl, Newark, N. J.....31
Felder Chas., 1 3 Chambers, N. Y.....32

Founders and Machinists.
Foundry Facing Co., 121 Chambers, N. Y.....34
Garrison A. & Co. Pittsburgh, Pa.....4

Galvanized Iron.
Lefferts Marshall Jr., 90 Beekman, N. Y.....4

Gas Fixtures, *Makers of.*
Bradley & Hubbard Mfg. Co., 21 & 23 Barclay, N. Y..40

Glass, *Importers of.*
Downing A. C. & Co., 57 Beekman, N. Y.....31

Governors.
Hartford Governor Co., Hartford, Ct.....38
Junius Judson & Son, Rochester, N. Y.....38
Shive Governor Co., Bethlehem, Pa.....38

Grindstones.
Wood Walter R., 283 and 285 Front, N. Y.....32
Wortnington & Sons, North Amherst, O.....33

Guns &c
Schoverling & Daly, 84 Chamber St.....27
Tryon Edw. K., Jr., & Co., 19 N. Sixth, Philadelphia..18
Windmuller Louis & Roelker, 30 Reade N. Y.....31

Gunpowder, *Makers of.*
Kneeland F. L. (Duporti 70 Wall, N. Y.....36
Laflin & Rand Powder Co. 21 Park Row, N. Y.....36

Hammers, etc., *Manufacturers of.*
Emmet Hammer Co., Brooklyn, E. D., N. Y.....13
Hammond H., Hartford, Ct.....8

Handles, *Makers of*
N. Carolina Han dle Co., 79 Reade, N. Y.....10
John Crane Agt., 103 Chambers, N. Y.....6

Hardware Commission Merchants.
Dodge William A., 96 Chambers, N. Y.....18
Graham & Haines, 88 Chambers, N. Y.....34
Heaton & Denckla, Phila. and N. Y.....6
Peck G. Webster, 110 Chambers, N. Y.....19
Walbridge G. B. & Co. 99 Chambers, N. Y.....31
Walsh, Coulter & Flazier, 83 Chambers, N. Y.....8
Wilson J. Clark & Co., 81 Beekman N. Y.....10

Hardware Dealers.
Brower John L. & Son, 288 Greenwich, N. Y.....8
Lloyd, Supplee & Walton, 625 Market, Phila.....10
Quackenbush, Townsend & Co., 59 Reade, N. Y.....34
Shepard Sidney & Co., Buffalo N. Y.....31
Wilson J. Clark & Co., 81 Beekman, N. Y.....10

Hardware Importers.
Boker Hermann & Co., 101 Duane, N. Y.....32
Field Alfred & Co. 93 Chambers, N. Y.....33
King, Briggs & Co., 80 Chambers N. Y.....10
Van Wart & McCoy, 134 and 136 Duane, N. Y.....10
Turner R. A., 76 Chambers N. Y.....11
Windmuller Louis & Roelker 30 Reade N. Y.....30

Hardware Manufacturers.
American Spiral Spring Bu t Co., 82 Beekman, N. Y..40
Buffalo Hardware Co., Buffalo, N. Y.....3
Enterprise Mfg. Co., Phila.....34
Hart, Bliven & Mead Mfg. Co., 243 Pearl N. Y.....34
Many & Marshall, 48 Warren N. Y.....13
Middletown Tool Co., 18 & 20 Cliff, N. Y.....6
Miller's Falls Mfg. Co., 78 Beekman, N. Y.....23
Pratt & Co., Buffalo, N. Y.....
Providence Tool Co., Providence, R. I.....13
Schweitzer Mfg. Co., 57 Reade, N. Y.....18
The Hull & Belden Co., Danbury, Conn.....16
Union Mfg. Co. 99 Chambers, N. Y.....7
Van Wagoner & Williams, 82 Beekman, N. Y.....40
Williams, White & Churchill, 73 Warren, N. Y.....26
Wilson Mfg. Co., 37 Chambers, N. Y.....12

Hardware Specialties.
Bracher T. W., 77 Greene, N. Y.....37
Bringham & Northup Rochelle, Ills.....24
Eagle Mfg. Co., Newark, N. J., and 62 Duane, N. Y..2
Foster C., Burlington, Vt.....7
Shepard Sidney & Co., Buffalo, N. Y.....31

Hoes, *Maker of.*
Rogers H. C., Jordan, N. Y.....17
Hicks O. H. & Co., Baltimore, Md.....6

Hoisting Engines, *Makers of.*
Crane Bros. Mfg. Co., Chicago, Ill.....16
Otis Bros. & Co., 348 Broadway, N. Y.....9

Horse Hay Forks and Fixtures, *Makers of.*
Nellis A. J. & Co., Pittsburgh, Pa.....40

Horse Nails, *Makers of.*
Ausable Horse Nail Co., 35 Chambers, N. Y.....32
Brundage & Co., Middletown, N. Y.....10
Globe Nail Co., Boston, Mass.....32
Platt & Co., Buffalo, N. Y.....31
Putnam S. S. & Co., Neponset, Mass.....10

Horse Shoes, *Makers of.*
Burden Iron Works, Troy, N. Y.....4
Rhode Island Horse Shoe Co., Providence, R. I.....13
Schoenberger & Co., Pittsburgh, Pa.....4
Semple, Birge & Co., St. Louis.....31

House Furnishing Goods.
Bracher T. W., 77 Greene, N. Y.....37
Tifft & Howard, 12 Murray, N. Y.....31

Hydraulic Jacks.
Dudgeon Richard, 24 Columbia, N. Y.....33

Ice Tools.
Carter W. H., 100 Chambers, N. Y.....33

Insurance, Boiler.
Hartford Steam Boiler Inspection and Insurance Co..29

Iron Brokers.
Boynton Geo. A., 70 Wall, N. Y.....4
Coleman & Bro., Louisville, Ky.....4
Crane U. O., 100 John, N. Y.....4
Hatry A. G., Pittsburgh, Pa.....4
Hazard T. D., 201 Pearl, N. Y.....4

Iron Bridges.
Leighton Bridge and Iron Works, Rochester, N. Y..17

Iron, Charcoal, *Warm or Cold Blast.*
Quincy John W., 96 William, N. Y.....4

Iron Commission Merchants.
Justice Cox Jr. & Co., 303 Walnut, Phila.....5
Conklin Henry, 1 4 John, N. Y.....4
Hand Jas. C. & Co., 614 and 616 Market, Phila.....6
Hoopes W. Graham, 419 Walnut, Phila.....5
Malin Bros., 223 Dock, Phila.....5
Spooner & Collins, St. Louis, Mo.....5

Iron, Pig, *Importers of.*
Williamson James & Co. 69 Wall, N. Y.....4

Iron Pig, *Manufacturers of*
Parrott Peter P., Orauge co., N. Y.....5

Iron Dealers.
Abeel Brothers, 190 South, N. Y.....4
Bonnell, Botsford & Co., Youngstown, O.....5
Borden & Lovell, 70 and 71 West, N. Y.....4
Cleveland, Brown & Co., Cleveland, O.....5
Coddington T. B. & Co., 25 Cliff, N. Y.....4
Huerstel G., 99 Market Slip, N. Y.....4
Fuller, Lord & Co., 139 Greenwich, N. Y.....4
Fuller, Dana & Fitz, 110 North, Boston.....2
Gardner Wm., 575 Grand, N. Y.....4
Harrison & Gilloon, 558 to 562 Water, N. Y.....4
Holden, Hopkins & Stokes, 104 Joun, N. Y.....4
Jackson & Chase, 206 and 208 Franklin, N. Y.....4
Judson B. F., 457 and 459 Water, N. Y.....4
Matthews Chas. W., 133 Walnut Phila.....5
Ogden Wallace, 85, 87, 89 and 91 Elm, N. Y.....4
Packard, Goff & Co., Youngstown, O.....4
Pettee & Mann, 228 and 229 South, N. Y.....4
Pierson & Co., 24 Broadway, N. Y.....4
Quincy John W., 96 William, N. Y.....4
Reed John H. & Co.....
Richards D. W. & Co., 92 Mangin St., N. Y.....4
Richardson J. O., 329 Walnut, Philadelphia.....5
Snyder Asa, Richmond, Va.....4
Wallace Wm. H. & Co., Albany and Washington streets, N. Y.....4
Warner A. B. & Sons, 28 and 29 West, N. Y.....4
Williamson James & Co., 69 Wall, N. Y.....4
Whitney A. R. & Co., 58 Hudson N. Y.....4

Iron, *Manufacturers of.*
Britannia Iron Works, Middlesbro', Eng.....6
Burden Iron Works, Troy, N. Y.....4
Cleveland Rolling Mill Co., Clevelana, O.....6
Coffin Wm. E. & Co., 8 Oliver, Boston.....4
Boston Rolling Mills, 17 Batterymarch, Boston.....4
Everson, Macrum & Co., Pittsburgh, Pa.....4
Girard Rolling Mill Co., Girard, O.....4
Lacka wanna Iron and Coal Co., Scranton, Pa.....5
Leonard John, 459 & 451 West st., N. Y.....4
Milwaukee Iron Co., Milwaukee, Wis.....6
Naylor & Co., 6 Oliver, Boston.....4
Old Dominion Iron & Nail Works Co., Richmond, Va. 6
Oxford Iron Co., 81 Washington, N. Y.....4
Phœnix Iron Co., 410 Walnut, Phila.....5
Rowland Wm. & Harvey, Phila.....41
Shoenberger & Co., Pittsburgh.....4
Taylor, Mitchell & Pond, Massillon, O.....4

Iron, Swedish, *Importers of.*
Jessop Wm. & Sons, 91 and 93 John, N. Y.....36
Mitander Nils, 69 William, N. Y.....4

Keys and Cotters. *Manufacturers of.*
Barnes Geo. & Co., Syracuse, N. Y.....36

Knitting Machines, Upright Rotary, *Makers of.*
Clark Tompkins, Troy, N. Y.....31

Lace Leather, *Manufacturers of.*
Yates Geo. S., Pawtucket, R. I.....26

Lamps, *Manufacturers of.*
Patent Mechanical Lamp Co., 138 Chambers, N. Y...18

Lanterns. *Manufacturers of.*
Dietz R. E., (Tubular) 54 and 56 Fulton, N. Y.....41
Howard & Morse, 45 Fulton, N. Y.....2

Lead Pipe &c., *Manufacturers of.*
Bayley, Farrell & Co., Pittsburgh, Pa.....2

Locks, *Manufacturers of*
American Lock Mfg. Co., Cazenovia, N. Y.....19
Bohannan Wilson, Broadway and Kosauth, Brooklyn, E. D.....7
D. K. Miller Lock Co., 112 Cherry, Philadelphia.....41
Romer & Co., Newark, N. J.....11
Tower John J., 99 Chambers, N. Y.....15
Trenton Lock Co., 49 Warren, N. Y.....13
Union Nut Co., 78 Beekman, N. Y.....73
Yale Lock Mfg. Co., 298 Broadway, N. Y.....10

Lubricators (Patent) *Maker of.*
Crossley H., Brooklyn, N. Y.....33

Machinery, *Makers of.*
Forsaith S. C. & Co., Manchester, N. H.....35
Pratt & Whitney Co., Hartford, Conn.....28
Sellers Wm., & Co., 1600 Hamilton Phila.....30
The Hull & Belden Co., Danbury, Conn.....
Wetherill Robert & Co., Chester, Pa.....38
Whittier Machine Co., 176 Tremont, Boston, Mass...28
Wood Thomas, 2105 Wood, Phila.....29

Machine Screws, *Makers of.*
American Screw Co., Providence, R. I.....13
Lyon & Fellows Mfg. Co., Williamsburg, N. Y.....26
Reynolds & Co., New Haven, Conn.....4
Rochester Machine Screw Co., Rochester, N. Y.....13

Machinists' Tools, *Makers of.*
Bladdell P. & Co., Worcester Mass.....59
Harrington Edwin & Son, 15th st. and Pa. ave., Phila.32
Jones, Lamson & Co., Windsor, Vt.....34
Le Count C. W., South Norwalk, Conn.....10
New Haven Mfg. Co., New Haven, Ct.....39

Machinery and Tools, *Importers of.*
Graham Bros., 122 Cannon street, London, E. C.....36

Malleable Articles, *Maker of.*
Hammer & Co., Branford, Ct.....32

Manganese.
Hobbs, Pope & Co., 95 India st., Boston.....4

Measuring Tapes.
Eddy Geo. & Co., 333 Classon Ave., Brooklyn, N. Y..13

Metal Dealers and Brokers.
Coddington T. B. & Co., 25 and 27 Cliff, N. Y.....
Colt Edward W., 205½ Walnut, Phila.....4
Cort N. L. & Co., 220 & 222 Water, N. Y.....2
Crane U. O., 100 John, N. Y.....4
Crocker Bros., 32 Cliff, N. Y.....9
Gregg H. L. Co., 108 Walnut, Phila.....5
Lefferts J. C., 241 Pearl, N. Y.....4
W. J. Hammond, Pittsburgh, Pa.....2
Phelps, Dodge & Co., Cliff, bet. John & Fulton, N. Y.2
Purves A. B. & Son, cor. South and Penn, Phila.....20
Quincy J. T. & Son, Williams, N. Y.....2
Sturges Frank & Co., 72, 74 & 76 Lake, Chicago.....3
Thomson A. A. & Co., 213 and 215 Water, N. Y.....3
Van Wart & McCoy, 134 and 136 Duane N. Y.....2

Metaline
American Metaline Co., 61 Warren.....40

Metallurgists.
Britton J. Bledgett 339 Walnut, Phila.....6
Maynard & Van Rensselaer, 261½ Broadway, N. Y.....6
School of Mines, E. 49th, N. Y.....6

Mine Chopping Machinery.
Murray Iron Works, Burlington, Iowa.....11

Mining Spikes
Roseberry Geo. D., Pottsville, Pa.....4

Miner's Candles, *Makers of.*
Joseph Boyd's Sons, 12 Franklin N. Y.....31

Molders' Tools.
Carter H., 200 Pearl, N. Y.....10

Mop Heads. *Manufacturers of.*
Buffalo Hardware Co., Buffalo N. Y.....3

Mouse Traps, Catchemalive, *Makers of.*
Dietz R. E., 54 and 56 Fulton, N. Y.....40

Nails.
Schoenberger & Co., Pittsburgh, Pa.....4

Nail Machinery.
Gugiepery D., 84 Ave. B., N. Y.....38

Nail Pulers.
Maltby, Curtiss & Co., 34 Reade, N. Y.....16

Nickel Platers.
Hartman John, 1042 Ridge avenue, Philadelphia.....2
New York Nickel Plating Co., 138 West 24th, N. Y...2

Norway Shapes, *Rollers of.*
Rowland Wm. & Harvey, Frankford, Phila.....40

Note Broker.
Gallaudet P. W., 3 and 5 Wall, N. Y.....4

Nuts, Bolts, etc., *Makers of.*
American Bolt Co., 210 Lawrence, Lowell, Mass.....13
Arms, Bell & Co., Youngstown, O.....12
Carpenter David, 402 Water N. Y.....4
Clark Bros. & Co., Millidale, Conn.....12
Fuller, Lord & Co., 139 Greenwich, N. Y.....4
Haskell W. H. & Co., Pawtucket, R. I.....18
Hoopes & Townsend, 1230 Buttonwood, Phila.....12
Lewis, Oliver & Phillips, Pittsburgh, Pa.....13
New Haven Nut Co., Westville, Ct.....28
Ola Colony Rivet Works, 116 Chambers, N. Y.....12
Roseberry Geo. D., Pottsville, Pa.....4
Russell, Birdsall & Ward, Port Chester, N. Y.....40
Plumb, Burdict & Barnard, Buffalo, N. Y.....40
Shelton Co., Birmingham, Conn.....34
Sternbergen J. H., Reading, Pa.....18
Union Nut Co., 78 Beekman N. Y.....33

Oil Stones, *Makers of.*
Boyd & Chase, 107th street and 1st avenue, N. Y.....32

Old Iron, etc.
Gregg H. L. & Co., 108 Walnut, Philadelphia.....5

Ore Washers.
Blake Crusher Co., New Haven, Ct.....38

Packing for Engines, &c., *Manufacturers of.*
Glanding Jas. & Co., 115 Queen, Philadelphia.....30

Paints and Oils, *Dealers in.*
Devoe F. W. & Co., 117 Fulton, N. Y.....
Empire Iron Clad Paint Co., 20 West B'way, N. Y...24

Patent Solicitors.
A. V. Briesen, 258 Broadway, N. Y.....30
Burke & Fraser, 37 Park Row, N. Y.....28
Cox & Cox, 229 Broadway, N. Y.....28
Howson & Son, Phila. and Washington, D. C.....28
Munn & Co., *Scientific American* 37 Park Row N. Y. 38
Stetson T. D., 23 Murray, N. Y.....28

Picture Nails, etc., *Manufacturers of.*
Richards T. C. & Co., 17 Murray, N. Y.....3

Pipes, Fittings, etc., *Makers of.*
Elton, Cole & Burnham Co., 58 John, N. Y.....26
Magens & Co., Louisville, Ky.....27
Meyer Henry C. & Co., 48 Cliff, N. Y.....40
McNab & Harlin Mfg. Co., 36 John, N. Y.....23
Nelson, Finkel & Co., 469 E. 10th st., N. Y.....28
Pancoast & Maule, 227 Pear, Phila.....26

Pipe Threaders, Cutters, &c.,
Converse, M. D., 68 Park Place, N. Y.....24
Empire Mfg. Co., 18 William, N. Y.....33

Pipe, Water and Gas, *Makers of.*
Leighton Bridge and Iron Works, Rochester, N. Y. 18
McNeal John & Sons, Burlington, N. J.....6
Morris, Tasker & Co., 15 Gold, N. Y.....26
National Tube Works Co., 76 William, N. Y.....26
Warren Foundry & Mach. Co., Phillipsburg, N. J.....26
Wood R. D. & Co., 173 Broadway, N. Y.....26

Piston Packing.
Caulfield John & Co., 1321 Fairmount Ave., Phila....16

Plane Irons. *Manufacturer of*
Buck Bros., Millbury, Mass.....11
Middletown Tool Co., 18 & 20 Cliff, N. Y.....6

Planes, *Manufacturers of.*
Greenfield Tool Co., Greenfield, Mass.....34
Stanley Rule & Level Co., 35 Chambers, N. Y.....26

Plated Ware
Derby Silver Co., Derby, Ct.....40
Reed & Barton, 2 Maiden Lane, N. Y.....9
Rogers & Bro. 208 Broadway.....11

Plows, Chilled Iron *Makers of.*
South Bend Iron Works, South Bend, Ind.....25

Plumbago Lubricator.
Joseph Dixon Crucible Co., Jersey City, N. J.....40

Plumbers' Materials, *Manufacturers of*
Carr Wm. S. & Co., 106 Centre, N. Y.....36

Portable and Stationary Forges
Empire Portable Forge Co., 50 John, N. Y.....39

Presses, Power, *Makers of.*
Forsaith S. C. & Co., Manchester, N. H.....35

Presses, Power, *Makers of.*
Boomer & Boschert Press Co., Syracuse, N. Y., and 26 Beekman, N. Y.....24
The Stiles & Parker Press Co., Middletown, Ct.....33

Pressure Blowers. *Makers of.*
Sturtevant B. F., 72 Sudbury, Boston.....36
Wilbraham T. & Bros., 2316 Frankfort Ave., Phila..39

Pumps, *Makers of.*
Douglas W. & B., Middletown, Conn.....
Rich William A., 107 Reade, N. Y.....
Union Mfg. Co., 99 Chambers, N. Y.....
Valley Mch. Co., Easthampton, Mass.....

Pyrometers.
Brown Edward, 311 Walnut, Phila.....

Railroad Supplies.
Duyckinck W. G., 50 and 52 John, N. Y.....8
Jackson & Tyler, Baltimore, Md.....28
Potter Hoffman & Co., 110 Liberty N. Y.....6

Rails, *Importers of.*
Congreve Chas. & Son, 104 and 106 John, N. Y.....37

Rails, Iron or Steel, *Makers of.*
Atkins Bros., Pottsville, Pa.....6
Cambria Iron Co., Johnstown, Pa.....5
Cleveland Rolling Mill Co., Cleveland, O.....6
Griswold John A. & Co., Troy, N. Y.....36
Lackawanna Iron and Coal Co., Scranton, Pa.....5
Milwaukee Iron Co., Milwaukee, Wis.....6

Railway Track Tools.
Metcalf, Paul & Co., Pittsburgh, Pa.....28

Razor Straps, *Makers of.*
B. F. Badger, Charlestown, Mass.....36

Revolvers.
Tryon E. K., Jr., & Co., 320 N. 2d, Philadelphia.....16

Rivets.
Old Colony Rivet Works, 34 Warren, N. Y.....12
Timmes Peter, 291 North 6th, Brooklyn, E. D.....4

Road Scrapers &c., *Makers of.*
Revolving Scraper Co., Columbus, O.....19

Rolling Mill Machinery, etc., *Manufacturers of.*
Birmingham Iron Foundry, Birmingham, Ct.....4
Moore James, Cor 16th and Buttonwood, Phila.....35

Rules, *Manufacturers of.*
Stanley Rule and Level Co., 35 Chambers St.....16
Stephens & Co., Riverton, Ct.....3

Saddlery Hardware, *Makers of.*
Sargeant Mfg. Co., Newark, N. J.....40

Safe Deposit Co.
Penna. Warehousing & Safe Deposit Co., Front and Lombard, Philadelphia.....28

Sand and Emery Paper *Makers of*
Beader, Adamson & Co., 720 Market, Phila.....6

Sash Weights (sectional), *Manufacturers of.*
Moore Thos. J. & Co., Bedford ave., Brooklyn.....3
Sprague Sash Weight Co., Youngstown, O.....5

Sash Locks *Makers of.*
Hammond W. S., Lewisberry, Pa.....33

Saws, *Makers of.*
American Saw Co., Trenton, N. J.....10
Atkins E. C. & Co., Indianapolis, Ind.....10
Boynton E. M., 80 Beekman, N. Y.....10
Flint J. & Co., Rochester, N. Y.....10
Disston Henry & Sons, Phila.....29
James Ohlen, Columbus, O.....10
Peace Harvey W., Williamsburg, N. Y.....10
Spear & Jackson, 100 Chambers, N. Y.....33
Wheeler, Madden & Clemson, Middletown, N. Y.....10

Saw Frames, Wood, *Makers of.*
Boynton E. M., 80 Beekman, N. Y.....10
Peace Harvey W., Williamsburg, N. Y.....10

Scales, *Manufacturers of.*
Chattillon John & Sons, 91 Cliff, N. Y.....9
Rienle Bros., 9th near Coates, Phila.....26
Shattuck W. F. & Co., 113 Chambers, N. Y.....8
Universal Family Scale Co., Guilford, Conn.....18

Screws, *Makers of.*
American Screw Co., Providence, R. I.....13
Miles F. S., 226 Quarry, Phila.....12

Screws, *Importers of.*
Bruce Geo. W., 1 Platt, N. Y.....6
Fiein Alfred & Co., 93 Chambers, N. Y.....6
Gueutal George & Son, 39 W. 4th, N. Y.....10

Shovels, &c.
Clement & Hawks Mfg. Co., Northampton, Mass....10
Kimball Shovel Co., Baltimore, Md.....35
Middleboro Shovel Co., 63 Oliver, Boston.....34
N. Y. Shovel Works (screening Shovels), 1256 Broadway, N. Y.....18
Semple, Birge & Co., St. Louis, Mo.....24

Sheet Metal Workers.
East River S. M. Mfg. Co., 238 Pearl, N. Y.....33

Shears, Scissors &c.
R. Heinisch's Sons, 3 1 Broadway, N. Y.....11

Shutters, and Coiling, *makers of*
Clark & Co., 218 W. 26th st.....3

Smelting Works.
Reeves Paul S., 760 South Broad St. Phila.....40

Stamped and Japanned Tin Ware.
Shepard Sidney & Co., Buffalo, N. Y.....21
Sturges Frank & Co., 72, 74 & 76 Lake, Chicago.....3

Steam Hammers, etc., *Makers of.*
Bradley Mfg. Co., Syracuse, N. Y.....38
Dudgeon Richard, 24 Columbia, N. Y.....33

Stencils, *Manufacturers of*
Hale B. E. & Co., 56 & 58 Park Place, N. Y.....39
Stafford Mfg. Co., 66 Fulton, N. Y.....24

Snaps, Harness. *Makers of.*
Middletown Tool Co., 18 & 20 Cliff, N. Y.....6

Spikes, R. R. &c., *Manufacturers of*
Fairlon, G. W. Warren, Ohio.....5

Springs.
Rowland Wm. & Harvey, Frankford, Phila.....40

Squares, Steel and Iron, *Makers of.*
Hart, Bliven & Mead Mfg. Co., 243 Pearl, N. Y.....34

Steam Pumps, etc., *Manufacturers of*
Carr A. 49 Cortlandt, N. Y.....32
Crane Bros. Mfg. Co. Chicago, Ill.....6
Foster & Jamieson, 13 Adams, Brooklyn, N. Y.....27
Hall C. Henry & Co., 20 Cortlandt, N. Y.....16
Knowls Steam Pump Works, Warren, Mass.....38
Philadelphia Hydraulic Works, cor. Evelina and Levant, Philadelphia.....39
Steele & Condict, 98 Liberty, N. Y.....38

Steam Traps.
Jones Alonzo L., 51 S. 4th, Phila.....12
Richards & Price, 235 Ledger Place, Philadelphia...36
Townsend & Blessing, Albany, N. Y.....39

Steel Castings, *Manufacturers of*
Flagg Stanley G. & Co., 216 & 218 N. 3rd, Phila.....40
The McHattie Steel Castings Co., Evelina and Levant Streets Philadelphia.....23

Steel Importers.
Carr J. & Riley, 82 John, N. Y.....36
Cocker Bros., Sheffield, England.....36
Hobson Francis & Son, 97 John, N. Y.....36
Jessop Wm. & Sons, 91 and 93 John, N. Y.....36
Moss F. W., 80 John, N. Y.....36
Piersons & Co., 24 Broadway, N. Y.....4
Sanderson Bros. & Co., 16 Cliff, N. Y.....36
Sanderson Geo. & Co., 57 John, N. Y.....36
Van Wart & McCoy, 134 and 136 Duane, N. Y.....31
Wardlow S. & C., 95 John, N. Y.....36
W Hawksworth, Ellison & Co., 72 John, N. Y.....36

Steel Manufacturers.
Anderson & Woods Pittsburgh.....37
Chrome Steel Co., Brooklyn, E. D.....36
Cleveland Rolling Mill Co., Cleveland, O.....6
Gautier D. G. & Co., Jersey City, N. J.....36
Farist & Windsor Bridgport, Ct.....27
Griswold John A. & Co., Troy, N. Y.....26
Hussey, Wells & Co., Pittsburgh.....32
Miller, Barr & Parkin, Pittsburgh.....36
Rowland Wm. & Harvey, Frankford Phila.....40
Smith, Sutton & Co., Pittsburgh, Pa.....37
Singer, Nimick & Co., Pittsburgh.....36

Stop Cocks (Water Gas &c.,) *Makers of*
Hurchinson J. R. & Co., Allegheny, Pa.....

Stone Crushing Machines.
Blake Crusher Co., New Haven, Ct.....38

Stoves, *Makers of*
Burdett, Smith & Co., Troy, N. Y.....24
Perry & Co., Albany, N. Y.....16

Stove Boards, *Manufacturers of.*
Shepard Sidney & Co., Buffalo N. Y.....31

Stove Polish, *Makers of*
Joseph Dixon Crucible Co., Jersey City, N. J.....40

Twist Drills, *Manufacturers of.*
Morse Twist Drill & Mach. Co., N. Bedford Mass..38

Tackle Blocks, *Makers of.*
Burr & Co., 31 Peck Slip, N. Y.....37
Penfield Block Works, Lockport, N. Y.....18
Tiebout W. & J., 290 Pearl, N. Y.....12

Tacks.
American Tack Co., 117 Chambers, N. Y.....15
Dunbar, Hobart & Whidden, 116 Chambers, N. Y.....9
Field A. & Sons, Taunton, Mass.....17
Grundy & Kenworthy, 165 Greenwich, N. Y.....34
Loring Samuel, Plymouth, Mass.....34
Shelton Co., Birmingham, Ct.....34

Telegraphic Instruments.
Brittain R. J., 118 Bergen St., Newark, N. J.....16

Tinners' Tools and Machines.
Headley W. L., 35 William, N. Y.....7

Tube Expanders.
Dudgeon Richard, 24 Columbia, N. Y.....33

Vises, Hanging Baskets &c.
Walbridge Chas. E., Buffalo, N. Y.....18

Valves, Gas, Water and Steam.
Chapman Valve Co., 75 & 77 Kilby, Boston.....26
Mohawk & Hudson Mfg. Co., Waterford, N. Y.....27
Ludlow Valve Mfg. Co., Troy, N. Y.....39

Ventilators.
Bracher T. W., 77 Greene, N. Y.....37

Vises.
Backus Vise Co., 78 Beekman, N. Y.....28
Fisher & Norris Trenton N. J.....25
Trenton Vise & Tool Works, 101 & 103

Petroleum in Iron Manufacture.

The following concerning the use of petroleum as a fuel for iron making is from the *American Exchange and Review:*

"It is now almost universally conceded that the proper form of fuel to be used in the manufacture of metallic substances is the gaseous one, to obtain which various apparatus have been patented for volatilizing coals with the aid of steam and air in retorts, and other contrivances, and carry the gas fuel thus produced to the furnace chamber for combustion. Various and great advantages are claimed for this method of working, prominent among which are greater intensity of heat (consequently, more work done in a given time), changing the character of the fire and the regenerate principle of producing intensity of blast. In carefully studying the subject, and from a practical investigation of it, we find nothing of merit in the coal gas or carbon oxygen, for that cannot be claimed for the petroleum or hydrocarbon; yet many points to be condemned in the former do not exist in the latter. First, a coal gas fire must be run continually to be economical, while a hydro-carbon need not. Second, all coal contains more or less sulphur, which, volatilizing at a low temperature, and coming in contact with superheated steam, forms sulphuric acid, which tends to destroy the nature of any metallic substances except the more precious ones, a disadvantage which the petroleum fuel does not contend with, being practically free from deleterious substances; so when we say that the hydro-carbon flame is pure and gentle, we mean it in its strictest sense, and that it is equal, if not superior, to charcoal, in this respect, at least. In all manufacturing interests, the quantity of work done per man or furnace is a great desideratum; but this must not be done at the expense of the quality, which, in the same market, must always take precedence. Thus, a ton of iron, wrought from coals filled with sulphur and other deleterious ingredients, can never compete with that worked with the unadulterated flames of hydrogen and carbon, provided the cost is equal; but if the hydro-carbon can be shown to be the cheaper, a capable manufacturer could not hesitate in making a choice. To give a practical illustration of the foregoing assertions, the English government, desirous of producing the best rolled iron armor for its iron clads, has ignored the English coal gas furnaces, and is rolling these plates at Woolwich arsenal with American petroleum."

The mechanical ingenuity of Andrew Fleming, a blind man, who lately died at Glasgow, deserves a brief notice. Fleming, whose age at the time of his death was about forty-four, was born in the neighboring town of Paisley, and learned the trade of a molder whilst working at the Phœnix Iron Works, Glasgow. Some years ago he lost his sight by an accident, and was admitted into the Glasgow Asylum for the Blind. It was in this institution that his remarkable faculty for inventing and constructing machinery was developed, his object being to make appliances which could be worked by blind persons, thus obviating the necessity of employing ordinary workmen to perform the labor. The first result of his ingenuity was a cropping machine, used to trim the brush mats manufactured at the asylum. This is fitted with four revolving knives and one stationary, placed at such an angle that they act as shears. The head upon which these knives are placed moves gradually along the face of the mat—the machine having two motions, one of which provides motive power to the rollers upon which the mat is placed, and the other being a horizontal movement, propelling the head of the knives along a grooved shaft. The work now effected by this machine, managed by a blind person, was formerly done by a person gifted with sight at a much slower rate, the instrument used being an ordinary pair of shears. Fleming's next machine is for boring brushes, and is an adaptation of the vertical principle of boring, and although it cannot be used for all the purposes required for boring brushes, yet much of the work is accomplished by its means, and it has the additional recommendation of being under the control of a blind person. An appliance for boring the rims of riddles comes next in order, and this not only answers its purpose well, but is a practical proof of Fleming's mechanical skill. A short time previous to this event he was engaged in constructing the model of a machine to supersede the hand labor in an important branch of riddle making.

The *National Oil Journal* says: There is little doubt that the gas escaping constantly from oil wells is of nearly or quiet as much value as the oil itself; and it is a matter of wonder that means have not long since been adopted to utilize this immense product of the earth. No estimate can be made of the quantity of this gas, which has for years been allowed to pass away into the air uselessly; but the yield of a few gas wells which have been tubed and their product utilized, indicates that it is enormous. A gas well near Sarversville, in the Butler oil region, flows with a pressure of 300 pounds to the square inch, and is roughly estimated to yield a million cubic feet of gas every 24 hours; and this is only one of quite a number of large gas wells, and almost numberless small ones, for it must be remembered that every well which produces oil also yields gas. A survey has just been completed for a line of pipe from Sarversville to Pittsburgh, a distance of about 17 miles. It is proposed to lay a six inch pipe between the points named, and to supply the gas to manufacturing establishments as a substitute for coal for fuel in Pittsburgh.

Operations at Barree Forge have been indefinitely suspended since the death of Mr. Mumper. The heirs are not of age and the legal representatives refuse to proceed. This throws over 200 employes out of work.

Stafford Manufacturing Co.'s

STENCIL COMBINATIONS.

Containing: Stencil Alphabet, Figures, Can Stencil Ink and Brush.

For marking boxes, barrels, bags, and packages for shipment. Printing all manner of show cards, notices, signs, numbers, prices, &c., and other purposes too numerous to mention. Instructive and amusing for boys.

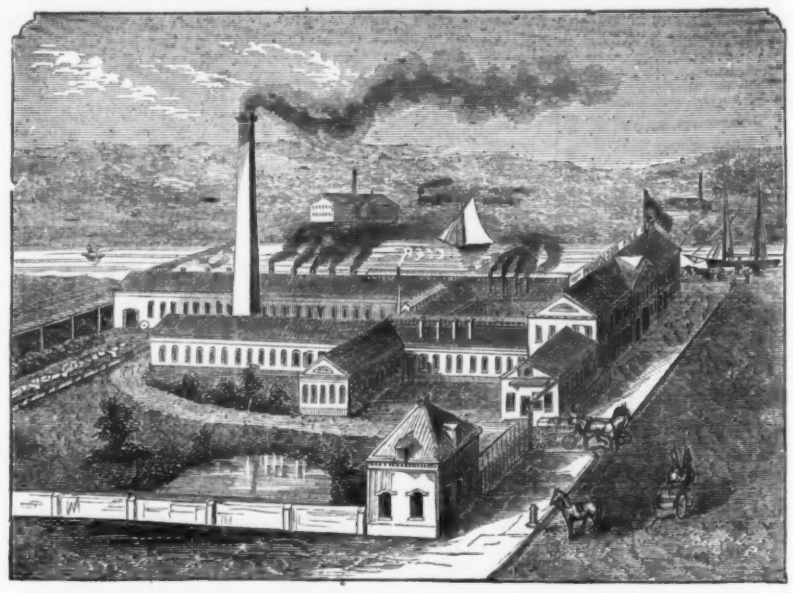
WHOLESALE PRICES.

Size, ½ in., per dozen	$6·00	Size, 1½ in., per dozen	$10·00
" ¾ " "	6·50	" 2 " "	12·00
" 1 " "	7·00	" 2½ " "	18·00
" 1¼ " "	9·00	" 1½ " with lower case	15·00

An Illustration of sizes sent on application.

For sale by Hardware Dealers and Stationers.

No. 66 Fulton Street, New York.



DEALERS AND CONSUMERS

OF FILES

SHOULD PURCHASE THE

Nicholson or "Increment Cut" File

FOR THE FOLLOWING REASONS:

First.—They are made from the best quality of File Steel.

Second.—Each File undergoes a careful inspection after each operation, by critical inspectors, and none but perfect work allowed to pass.

Third.—They are cut by the **"Increment"** or **irregular cut,** therefore combine the advantages of both Hand and Machine work.

Fourth.—They **will finish finer** than Files of any other make of same degree of coarseness.

Fifth.—They **will not "pin"** or scratch like hand-cut Files.

Sixth.—The **"Increment cut"** File, by our records, **will remove more stock with a given number of pounds applied** than any other File with which we are acquainted.

Seventh.—All Files under seven inches are **put up in boxes** of one dozen each, and neatly labeled.

Eighth.—The large stock carried by us, combined with our superior facilities, enables us to fill the largest orders at the shortest possible notice.

Ninth.—We are constantly making careful tests of our Files by delicately constructed machinery, which **automatically records** the **actual power applied,** forward, backward and downward, at each stroke of the File, also the number of strokes, combined with the work performed, enables us not only to judge of the **quality of our Steel for wear,** but **also of the cutting qualities** of the File, and the ease (expressed in pounds) with which a given amount of work can be accomplished.

Finally.—Our Files **are warranted** to be **hard, well cut** and **sound.** They are exclusively used by many of the largest Railroads and Machinists in the country—and the vigorous growth of our reputation, not only for making a good article, but of **our ability to furnish a good article cheap,** is evidenced by the large number of Dealers and Jobbers who are handling our Files exclusively.

NICHOLSON FILE COMPANY, Providence, R. I.

SOLD BY HARDWARE DEALERS GENERALLY.

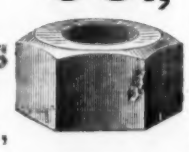
NEW HAVEN NUT CO.,

MANUFACTURERS OF

HOT PRESSED NUTS

Of Superior Quality of all sizes, both

HEXAGON & SQUARE,



From ⅜ inch to and including 1½ inch Bolt.

Factory and Office, - - - - - - WESTVILLE, CONN

SUPPLIES

FOR

Railways, Machinists and Amateurs,

Gum and Leather Belting, Packings and Cotton Waste, Babbit Metal.

FINE TOOLS

for Machinists and Amateurs; Barnes' Foot Power Scroll Saw; Foot Lathes all kinds. Sole Agents Baxter Steam Engine. Iron and Wood Working Machinery. Send for Price Lists.

JACKSON & TYLER,

16 German St., Baltimore, Md.

PENNA. WAREHOUSING AND SAFE DEPOSIT CO.

WAREHOUSES:

FRONT AND LOMBARD STREETS

IRON STORAGE YARDS:

Port Richmond, Philada; Reading, P. Allentown, Pa

NEGOTIABLE RECEIPTS ISSUED.

OFFICE OF THE CO.:

N. W. cor. Third & Chestnut S.

OFFICERS:

Thos. L. Jewett, President. | B. K. Jamison, Vice-President.
James P. Scott, Secretary and Treasurer. | J. M. Collinswood, Gen'l Sup.

DIRECTORS:

Henry Pemberton, Henry P. Sloan, P. C. Hollis, Geo. W. Woodward, J. H. Catherwood, D. A. Dangler, J. T. Audenried.

Schweitzer Mfg. Co.

57 Reade Street, New York.

MANUFACTURERS OF

Continental Locks.
Excelsior Dividers.
Excelsior Calipers.
Axes of the celebrated brands:
"Queen of the Forest."
"Wood Choppers' Pride."
Wetmore's Hatchets.
Tackle Blocks.
Brad Awls and Tools, (in sets.)

SOLE AGENTS FOR

Newbould's Files, Chisels, Pl... Irons and Tools.
Baldwin's Solid Cast Steel C... penters' Hammers, Mining ... Blacksmiths' Sledges and To...
Davis Level and Tool Co.'s c... brated Patent Adjust... Plumbs and Levels and In... nometers.
Improved Iron Bench Planes ... other Tools.
Chapin Machine Co.'s Boring ... chines.
Humphrey & Bartlett's H... Brushes.
H. Chapin's Son's Rules, Pla... Gauges, Plumbs and Levels, Squares, T Bevels, Hand Scre... &c.

IMPORTERS OF

Stubs' Files.
French Coffee Mills, and Gen... Hardware and Cutlery.

A complete and extensive stock always in sto... Catalogues mailed on application.

JAMES HENSHALL,

Engineer, Machinist & Blacksm...

1056 Beach St. PHILADELPHI...

Drawings made to order. Repairing of all ... promptly attended to. Blacksmithing exec... all its branches.

HOWSONS

OFFICES FOR PROCU ING

UNITED STATES AND FOR...

PATENTS

Forrest Buildings

119 SOUTH FOURTH ST., PHILADEL...

AND MARBLE BUILDINGS

605 Seventh St. (Opposite U. S. Patent ... Washington, D. C.

H. HOWSON, Solicitor of Patents. | C. HOWSON, Attorney ...

Communications should be addressed to the ... PRINCIPAL OFFICES PHILADELPH...

COX & CO...

Counsellors at Law

229 Broadway, NEW Y...

Practice in cases relating to

PATENTS and TRADE MAR...

Before the

Courts and Patent Offic...

Burke & Frase...

SOLICITORS OF

PATENT...

37 PARK ROW, N. Y. CI...

Established 1851. *Also Consulting ...*

Manual of Patent ...

AND

"SALE OF PATENT..."

For Inventors and Manufacturers. Commen... paper. Postpaid, $2 50. Address for Circular... W. E. SIMONDS, (Counsellor in Patent Law), Hartfor...

PATENTS. Thomas D... No. 22 Murray ... Solicitor of P... Scientific Ex... tent cases.

Send for circular.

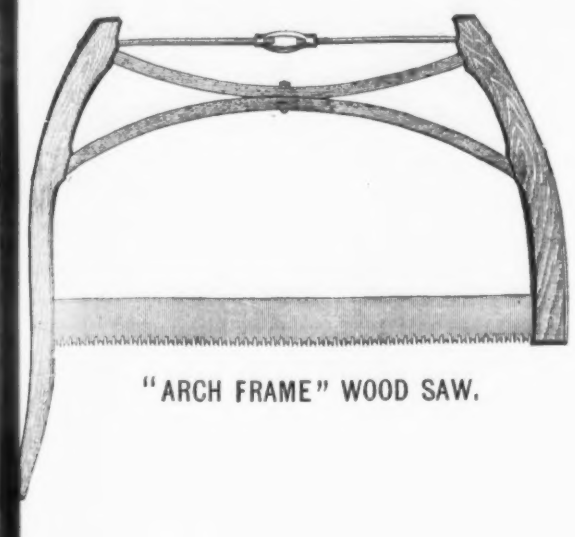
HENRY DISSTON & SONS,

Keystone Saw, Tool, Steel and File Works.

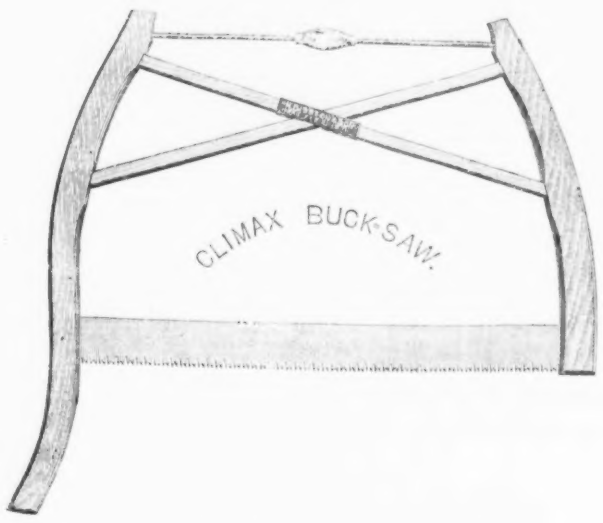
Front and Laurel Streets, Philadelphia.

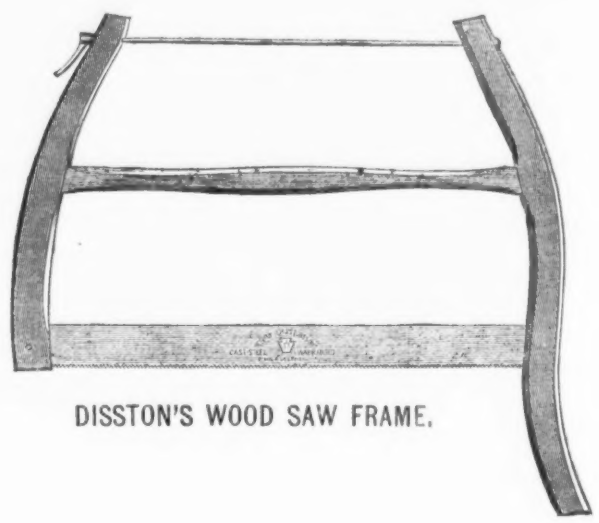
Branch Works, Tacony, Philadelphia.

Branch House, Randolph & Market Streets, Chicago, Ill.



"ARCH FRAME" WOOD SAW.





DISSTON'S WOOD SAW FRAME.

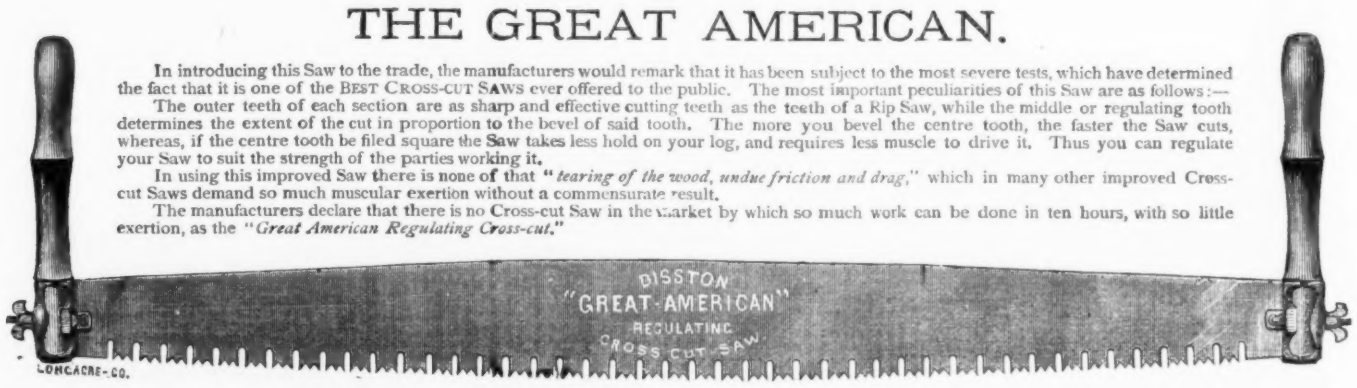
THE GREAT AMERICAN.

In introducing this Saw to the trade, the manufacturers would remark that it has been subject to the most severe tests, which have determined the fact that it is one of the BEST CROSS-CUT SAWS ever offered to the public. The most important peculiarities of this Saw are as follows:—

The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more you bevel the centre tooth, the faster the Saw cuts, whereas, if the centre tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.

In using this improved Saw there is none of that "*tearing of the wood, undue friction and drag*," which in many other improved Cross-cut Saws demand so much muscular exertion without a commensurate result.

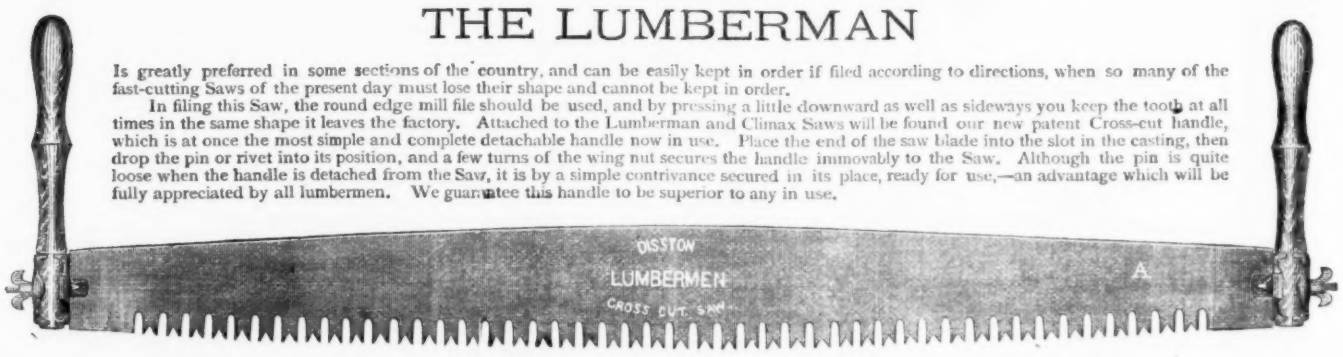
The manufacturers declare that there is no Cross-cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "*Great American Regulating Cross-cut.*"



THE LUMBERMAN

Is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast-cutting Saws of the present day must lose their shape and cannot be kept in order.

In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use.



THE CLIMAX.

The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed to be an advantage.

It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A Gauge for reducing the length of cleaner teeth will accompany each Saw.

THE NONPAREIL.

The Nonpareil, of which the accompanying cut is a representation, is composed of sections of four cutting teeth, each section intersected by a cleaner tooth. It will be observed that the cavities on each side of the cleaner teeth are much larger and deeper than those of the cutting teeth, serving as a receptacle or chamber for dust, and effectually freeing the Saw during the operation of cutting. The cleaner teeth should always be kept shorter or lower than the cutting tooth. (The Gauge, as shown below, is made expressly for this purpose, and by its use the cleaner teeth of any Saw can be regulated and kept of exact length.)

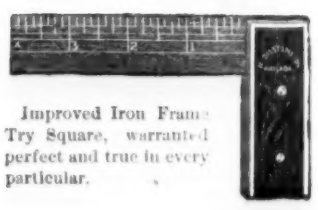
This Saw has given unbounded satisfaction wherever it has been used, and we are constantly receiving orders for the same; in fact, in some sections, and for sawing soft lumber, it is preferred to any other Saw.

Our Celebrated

CROSS-CUT SAWS.

Improved Pruning Saw and Knife, Patented August 29, 1873.

Gauge for Regulating Cleaning Teeth.



Improved Iron Frame Try Square, warranted perfect and true in every particular.

New York Wholesale Prices, June 30, 1875.

HARDWARE.

Anvils.
Solid Cast Steel.....₩ lb 14c
Wright's.....(2 gold lic; over 250 lbs 11½c, gold
Arms & Co.'s Morse Horse.....gold 11c
Wilkins'.....₩ lb gold 11c
Eagle Anvils.....₩ lb 8c

Apple Parers.
Domestic.....
Turn Table.....
Lightning.....
Ellwood's.....
Reading.....
Union.....
} $7.75 ₩ doz
Skeleton Paring, Coring and Slicing.....$5 00 ₩ doz net
Bay State, Paring, Coring and Slicing.....$15 00 dis 10 %
Climax Slicer.....8 00

Augers and Bits.
Dougill's.....
Ives'.....
Beech (Firench, Swift&Co)
Griswold.....
Challenge.....
} 1st quality.....dis 40&10 %
Nobles Mfg. Co.....dis 40 @ 40 25 %
Cook's.....dis 40&10&10 %
Snell Mfg. Co.....dis 22½ @ 25 %
Jennings' Bits.....dis 10 %
Lewis' Single Twist Bits.....dis 30 %
Andrews' Bits.....dis 25 %
Griswold's Patent Bits.....dis 20 %
Expansive Bits, Clark's....small, $18; large, $36.....dis 10 %
" " Ives'.....$30 @ $60—dis 30 %
" " Blake's.....$30—dis 40 %
Hollow Augers, Douglass'.....
" " Ives'.....
" " French, Swift & Co.....
} dis 40 %
" " Bonney's Adjustable.₩ doz $48—dis 25 %
" " Stearns' " ₩ doz $48—dis 25 %
" " Ives' Expansive.....each $4 50—dis 40 %
" " Universal Expansive, each $4 50—dis 10 %
Gimlet Bits—Screw, $7 50; no screw, $6.....dis 20&10 %
Double Cut Gimlet Bits, Shepardson's.....dis 30 %
" " Hartwell's.....dis 50 %
" " Douglass'.....dis 25&10 %
" " Ives'.....dis 30 %
Morse's Bit Stock Drills.....dis 20 %
L'Hommedieu's Ship Augers.....dis 10 @ 30 %
Watrous Ship Augers.....dis 15 %
Vaughan's Post Hole—
6 in. $3 60; 7, 8 and 9 in $25 per doz.....dis 20 %

Awls, Brad Sets, &c.
Awls, Sewing.....per gross $1 20—dis 10 %
" Shouldered Peg.....per gross 2 75—dis 10 %
" Patent Peg.....per gross 4 00—dis 10 %
" Shouldered Brad.....per gross 2 25—dis 10 %
Brad Sets, Clark's.....dis 25 %
" " Nos. 42 and 43.....dis 35&10 %
" " Clark's.....dis 30&10 %
" " Stanley's Excelsior.....$18 50—dis 25&10 %

Axes.
Brook's.....per doz $12 00 @ 14 00 net
Blood's.....per doz $15 00 @ 16 50—dis 20 %
Hunt's.....₩ doz $12 50 @ 14 00
Collins'.....₩ doz 11 00 @ 15 50 net @ dis 5 %
B. Clark's (J. C. W. & Co.) brond'or ned.₩ doz $10 00 net
Hurd's.....₩ doz 10 50 @ 12 50
Shumous'.....₩ doz 11 00 @ 13 50
Morris'.....₩ doz 12 50 @ 13 50
Red Jacket.....₩ doz 12 00 @ 12 50
Mann's.....₩ doz 11 50 @ 13 00
" Double Bitted.....₩ doz 21 50 @ 22 00
Underhill's.....₩ doz 12 00 @ 13 00
" Crown.....₩ doz 12 50 @ 13 50
John Leverett's.....₩ doz 14 50 @ 15 50
Tea Eyed.....₩ doz $10 00 @ 12 50 net
M. H. Jones & Co.....₩ doz 10 50 @ 12 50 net
Nobles Mfg. Co.....per doz $10 50, net

Balances......dis 35 %

Bands.
Plated.....new list dis 50&5 %
Iron Rim.....new list dis 25&5 %
Brass (Plated list).....new list dis 50, 10&5 %
Oroide.....new list dis 50&5 %

Bells.
Hand, Light Brass.....dis 70&5 @ 70&10 %
" Extra Heavy.....dis 40&10 %
" White Metal.....dis 50&10 %
" Silver Chime.....dis 15&10 %
" Swiss.....dis 25 %
" Globe (Cone's Patent).....dis 15&10 %
Gong Adee's.....dis 15&10 %
" Yankee.....dis 33&10 %
" Barton's.....dis 33½ %
Cank, Taylor's.....dis 25 %
" Brook's.....dis 50 %
" Cone's.....dis 10 %
" Schmidt's.....dis 50&10 %
Lever, Sargent's.....dis 60&10&10 %
" Taylor's.....dis 25 %
" Hart, Bilven & Mead Mfg. Co.....dis 50&10 %
Tull, " " " .....dis 50&10 %
" Brook's.....dis 50 %
" Wescott.....dis 25 %
Cow—Common Wrought.....dis 20&10 %
" Western.....dis 30&10 %
" " Sargent's.....dis 5&10&10 %
" Kentucky "Star".....dis 20&10 %
" " Sargent's.....dis 5&10&10 %
" Dodge's Genuine Kentucky, new list—
Nos. 0 1 1¼ 2 3 4 5 6 Hog.
$14 00 10 00 9 00 8 00 6 00 5 00 3 50 2 50 5 00—dis 45 %
" Yaw's Genuine.....dis 30 %
" Texas.....dis 35 %
Call.....dis 15 %

Bellows.
Blacksmiths'.....dis 20 %
Moulders'.....dis 20 %
Hand Bellows.....dis 10 %

Blind Adjusters.—Domestic.....₩ doz $3—dis 20 %

Blind Fasteners......dis 30 %
Mackrell's.....
Van Sand's, No. 2000, $14 00; No. 3705, $19 50.....net
Washburn's Patent.....₩ gross $14 00 net
Merriman's.....new list net

Blind Staples.
Boardman's patent, ½ in. and larger.....₩ lb 37 c
" ⅝ in....." 42 c

Blocks.
Tackle, Rope and Iron Strapped, Providence
Tool Co.'s list.....dis 30 %
Burr's.....dis 10 %
Stanley Rule and Level Co.....dis 5&10 %

Bolts.
Cast Iron Barrel, Shutter, &c.....dis 60&10 %
Cast Iron Chain.....dis 60&10&10 %
Wrought Iron Barrel.....dis 50, 10&10 %
" " Square.....dis 50, 10&10 %
" " Shutter.....dis 60&10 %
Wrought Iron Flush, Stanley's.....dis 10&10 %
" " " Sargent's.....is 50&10&10 %
Carriage and Tire, Common.....dis 75 %
" " Norway iron.....dis 50 .10 %
" " B. B. & W.....(old list) dis 60 %
" " Philadelphia, Star.....dis 55 %
" " Eagle.....dis 50 %
Union Nut Company, old list.....dis 60&10 %
Stove.....dis 25 %
" B. B. & W.....dis 25 %
Borax......19c. ₩ lb
Boring Machines.
Kellogg's.....dis 15 %
Snell Mfg. Co., Alee's Patent.....dis 20 %
" " Regular.....dis 30 %
Douglas Mfg. Co.....No. 5, $5 25; with Augers, $5 00 net
No. 2, 4 00 " " 6 00 net
Parr's.....dis 30&1 %
Thomas' Angular, complete with Augers.....each $7 25
Mortising Machines, $20 00 each.....dis 20 %

Bow Pins.
Union Nut Co.....new list dis 50&10&5 %
Hotchkiss'.....dis 50 @ 5 %
Hunnewell, Beckley & Co.'s.....dis 5&10&5 %
Sargent & Co.'s.....dis 50&10&10 %

Braces.
Barnes' Patent.....dis 40&5 %
Q. S. Jackson's.....dis 4&10 %
Wilson Mfg. Co.....dis 10 %
Spofford's Patent.....dis 5 %
Rogers' Patent.....dis 40&5 %
Ives' Novelty.....dis 40&7 ½&10 %
" Camden.....dis 15&10 %
Common Bell.....dis 15&10 %

Brackets.—Shelf.....dis 60&10 @ 65&10 %

Bright Wire Goods......dis 65&10&10 %

Bung Rings.—Union Nut Co., new list.....dis 50&10&5 %
Sargent's.....dis 60&10 %
Hodges'.....2¾ in., $2 25 net

Bung Hole Borers.
Cone's and Ring.....dis 20&10 %
Ives' Tap Borers.....dis 40&10 @ 25 %
Enterprise Mfg. Co.....dis 20 %

Butchers' Cleavers.
Hunnewell & Beckley Mfg. Co.....dis 20&10 %
Bradley's.....dis 25 %
Bentley's.....dis 20 %
2 3 4 5 6 7 8 9
$14 00 $21 00 $24 00 $27 00 $30 00 $33 50 $36 50 $41 00
Hart Mfg. Co.....dis 45&10 %
0 1 2 3 4 5 6
$25 25 $29 75 $34 25 $38 75 $43 25 $48 50 $54 00

Butts.
Wrought Brass.....dis 30 %
Cast Brass.....dis 20 %
Common Cast, not Drilled.
Fast Join', Narrow.....new list, dis 30&10 %
" Broad " dis 4&10 %
" " Jap'd.....dis 35&10 %
Loose Joint, Narrow and Broad.....dis 50&10 %
" " " Jap'd.....dis 45&10 %
Parliament Butts and Mayer's Hinges.....dis 4 &10 %
Loose Pin, all kinds.....dis 45&10 %
Drilled and Wired.
Fast Joint, Narrow.....new list, dis 25&10 %
" Broad " dis 35&10 %
" " Jap'd.....dis 30&10 %
" " with Acorns.....dis 3 &10 %
Loose Joint.....dis 4 &10 %
" Jap'd.....dis 25&10 %
" with Acorns.....dis 40&10 %
Parliament and Mayer's Hinges.....dis 50&10 %
Loose Pin, all kinds.....dis 4 &10 %
Wrought Iron.
Fast Joint, Narrow, Ir. and Regular.....dis 30 %
" Broad " dis 35 %
Loose Joint, Narrow and Broad.....dis 35 %
Table Butts, Back Flaps, &c.....dis 30 %
Inside Blind, Regular.....dis 30 %
" Light.....dis 40 %
Loose Pin, Wrt.....dis 35 %
Am. Spiral Spring Butt Co., list May 1st.....dis 20 %
Union Spring.....dis 20 %
Blind Butts, Parker.....dis 60 @ 60&10 %
" " Palmer.....dis 40 %
" " Seymour.....dis 55&10 %
" " Shepard.....dis 60 @ 5 &10 %
" " Lull & Porter.....dis 40&10 %
" " Nicholson.....dis 45&10 %
" " Huffer.....dis 33½&10 %
" " Garretson, No. 1.....dis 60 @ 60&10 %
" " Clark's, Nos. 1, 3 and 5.....dis 60 @ 60&10 %
" " Clark's No. 2.....dis 60&10 @ 65&10 %
" " Nos. 2, 4, 4½, 6, 8, 10.....dis 40 %

Caps—Percussion, per 1000.
G. D.....37 @ 40c
Ely's E. B.....1-4s, 55c.; 1-10s, 70c. gold
" Double Waterproof, 1-4s, $1 45; 1-10s, $1 35½c., gold
" 1-10s 80c gold

Carpet Sweepers.
Bolton.....each $2 75 net
Welcome.....each 2 75 net

Cartridges.—Metallic.....dis 50&10 %

Cards.—Horse and Curry.....dis 30&10 %
Cotton.....dis 10&10 %
Wool.....dis 10&10 %

Carpet Stretchers.
P. S. & W.....per doz $2 00; dis 40&5 %
Sargent's.....per doz $4 88—dis 50&10&10 %

Castors.
Bed.....dis 30&10 @ 40 %
Plate and Shallow Socket.....dis 40&10 %
Deep Socket.....dis 33½ %

Cattle Leaders......new list dis 60&10 %

Chain
Engiuan Coil.....net gold
₩ lb.....11¾ 8¾ 8¾ 7¾ 7¼ 7¼c
5-16 ¼ 5-16 ⅜ 7-16 ½
Trace, 6½-10-2.....by the cask, ₩ pair, gold 55c
Trace, 7-10-2.....by the cask, ₩ pair, gold, (2
German Halter Chain.....dis 20 % gold
German Coil.....₩ lb 13c
Galvanized Pump Chain.....dis 50&10 %
Jack Chain, Iron.....dis 40&10 %
" Brass.

Chalk.
White.....₩ gross, 57c net
Red.....₩ gross, 90c net
Blue.....₩ gross, $1 00 net
White Crayons.....₩ gross, 16¼c net

Chisels.
Socket Framing, Douglass, Extra.....dis 60&10&10 %
" " Crossman.....dis 50&15&10 %
" " Buck Bros...equivalent to dis 50&15 %
" " Hart Mfg. Co.....dis 60&10 %
" " Merrill.....dis 60&10 %
" Firmers, Douglass, Extra.....dis 60&10 %
" " Crossman.....dis 50&10&10 %
" " Buck Bros.....equivalent to dis 50&15 %
" " Hart Mfg. Co.....dis 60&5 %
" " Merrill.....dis 60 %
Socket Corner.....dis 60&10 %
Tanged Firmer.....dis 40&10 @ 50 %
Butcher's.....$5 50 to £ gold
Newbould's.....$5 50 to £ gold
Spear & Jackson's.....$5 50 to £ gold
Buck Bros (Shank).....$5 50 to £ gold

Clamps.
Cabinet.....dis 60&10 %
Gray's.....dis 20 %
Lambert's.....dis 20 %
Providence Tool Co.....dis 10 %

Clips, Axle.
Norway or Best.....dis 40 %
Superior.....dis 50 %
"Star." Superior Philadelphia.....dis 45&5 %

Coal Shovels.
Edgar's Pat. "Gem," Short and Long H'dled.....dis 15 %
Iron Handled.....₩ doz, ₩ 85 @ 1 25
Wooden Handled.....₩ doz, 1 00 @ 2 00

Coal Hods.—Smith, Burns & Co.....dis 15 @ 25 %

	14	15	16	17	18	inch.
Japanned	$6 00	6 25	6 75	7 50	8 00	per doz.
Galvanized	9 50	10 00	10 75	11 50	12 50	"

Morning Glory Funnel Hods—

	No. 15	16	17	
Japanned	$9 00	10 50	12 00	per doz
Galvanized	13 00	14 50	16 00	"

Sidney Shepard & Co.'s new list.....dis 10 %

Cockeyes....1¾ in., 28c.; 1¾ in., 33c.; 1¾ in., 37c. net

Cocks.
Brass Racking.....dis 33½ %
Lock and Globe.....dis 33½ %
Lever Bibbs.....dis 33½ %
Ale and Beer.....dis 20&10 @ 25&10 %

Coffee Mills.
Board and Box.....dis 15 @ 20 %
Increase Wilson's.....dis 20 %
Sebor's Pat.....$9 50, $10 50—dis 25 %
American (Enterprise Mfg. Co.).....dis 20 %
French Steel.....dis 15 %
The Swift.....dis 25 %

Compasses and Dividers.
Bemis & Call Co.'s.....dis 35&10 %
Cook's.....dis 15 %
Excelsior.....dis 30 %
Peck Stow & Wilcox.....dis 25 %
Miller's Patent.....dis 25 %

Coopers' Tools.
Bradley's.....dis 15 @ 20 %
Chas. E. Little.....dis 20 @ 25 %
Swan & Brombacher.....dis 15 @ 20 %

Corkscrews......dis 25 %

Corn Knives and Cutters.
Bradley's.....dis 10 %

Crow Bars.
Cast Steel.....₩ lb 11c. net
Iron, steel points.....₩ lb 6c

Crucibles.—Gautier & Co.....₩ No. 5½c

Curling Irons, &c.
⅜, ½, ⅝ in., $1 85, $2 00, $2 40.....dis 10 %
Curling Tongs.....₩ doz $6 50—dis 15
Pinching Irons.....₩ doz 7 50—dis 20 %

Curry Combs.
Hotchkiss' & Kellogg's, Iron & Brass, old list.dis 30&10 %
Fitch's (List of No 24's, $1).....dis 20&10 %
Rubber.....₩ doz, $9 00—dis 15 %

Curtain Pins.—Silvered Glass.....old list dis 54½ %

Cutlery.
American Table { Meriden } New list Jan. '75, dis 25 %
American Pocket { Cutlery Co } .....dis 25 %
Am. Pocket—Humason & Beckley Mfg. Co...dis 20&10 %

Dippers.
Britannia.....per doz 75c—dis 30 %; by bbl. dis 33½ %
Cocoa, Plain.....per doz $3 25—dis 20 %
" Rimmed.....per doz $3 75—dis 20 %

Dog Collars.
Embossed Gilt.....dis 20 %
Leather.....dis 20 %
Brass.....dis 25 %

Door Springs.
Gray's.....$7 50 ₩ doz—dis 50&10 %
Torrey's Patent.....$7 50 ₩ doz—dis 55 @ 55&10 %
Johnson's.....per doz $3 00 @ 4 00
Palmer's Japanned No. 6.....₩ doz $3 00
" Coppered " " 6 00
" Silvered " " 8 00
} dis 20 %
Challenge—
Japanned.....No. 9, per doz $4 00
No. 7, " 5 00
No. 6, " 6 00
} .....dis 40 %
Gem.—No. 1 large, Japanned.....per doz $4 00
No. 2 medium.....per doz $3 50
No. 3 small.....per doz 3 00
} dis 10 %
Barker's Concealed.....dis 12½ %

Drawing Knives.
Crossman's No. 1.....dis 50&15&10 %
Douglass, Extra.....dis 60&10&10 %
Hart Mfg. Co., No. 1.....dis 60 %
Merrill.....dis 60&10 %
Nobles Mfg. Co.....dis 15 %
Bradley's.....dis 25 %
Adjustable Handle.....dis 15 %

Drills and Drill Stocks.
Blacksmiths'.....each $2 60 net
" Self-Feeding.....each $8 00 net
Breast, P. S. & W.....dis 45 %
" Miller's Falls.....dis 25 %
" Aiken's.....dis 40 %
" Hotchkiss'.....dis 10 %
" Wilson's.....dis 10 %
Ratchet, Merrill's.....dis 20 %
" Ingersoll's.....dis 35 %
" Whitney's.....dis 20 %
" Weston's.....dis 20 %
" Moore's Triple Action.....dis 20 @ 25 %
Wilson's Drill Stocks.....dis 10 %
Automatic Boring Tools.....each $2 75—dis 20 %
Drill Chucks.—The Danbury..each 1-10, dis 20 @ 25 %
Beach Patent (Morse).....dis 15 %

Egg Beaters.

	8 in.	10 in.	
Monroe's	Per doz $3 00	9 00	dis 10 %
Dover		₩ doz $4 00	—dis 10 %
National		₩ doz $4 00	—dis 20 %
Peerless		₩ doz $4 00	—dis 10 %

Emery.
Genuine Chester—Regular Nos.....₩ lb 6c
" Flour and FF.....₩ lb 4c
} dis 10 %
Washington Mills—Regular Nos.....₩ lb 8c
" Flour.....₩ lb 5c

Enameled and Tinned Ware.
Kettles.....dis 30 @ 40 %
Sauce Pans.....dis 25 %
Glue Kettles.....dis 20 @ 25 %
Tinned Saucepans.....dis 25 %

Escutcheons.
Door Lock.....Same discounts as Door Locks
Brass Thread.....dis 60&10 %
Wood.....dis 25 %

Faucets.
Fenn's.....dis 50 %
" Cork Stops.....dis 40 %
Star.....dis 55&10 %
Fray's Patent Petroleum.....dis 15&10 %
Taylor's Pattern " .....dis 20&10 %
Wood and Metallic.....dis 40 %
Wood, Cork Lined.....dis 6 &10 %
Enterprise Mfg. Co., Self-Measuring.....d s 25 %

Fe-loc Plates......₩ lb 15c; dis 45 %

Files.
American File Co.....$5 00 to £ currency—dis 15 @ 20 %
Auburn File Co.....$5 00 to £ currency
Nicholson.....new list, Jan. 1, 1875, net
Hartford File Co.....$5 50 to £ currency—dis 10 %
L. B. Heller & Co.....$5 00 to £ currency
Heller & Bros.....$5 00 to £ currency
"Western".....5 00 to £ net
Rothery's.....$6 to £ currency
Black Diamond.....$5 to £ 0 rency, dis 10 %
J. & Riley Carr.....3 75 to £ gold
" Horse Rasps.....
Stubs'.....8 50 @ 9 00 to £ gold
Butcher's.....5 25 to £ gold
Walter Spencer & Co.'s "Diamond".....5 00 to £ gold
Spear & Jackson's.....5 00 to £ gold
Jowitt's.....5 00 to £ gold
Newbould's.....5 25 to £ gold
W. K. & C. Peace's "Imperial".....5 25 to £ gold
R. Ibbotson.....5 00 to £ gold
Turton Bros. & Matthews.....$5 50 to £ currency
Ashworth's (Van Wart & McCoy).$5 00 to £ cur. dis 10 %
Fisher's.....4 75 to £ gold
Goodlad's.....4 00 to £ gold
Moss & Gamble.....3 25 @ 5 50 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.)..5 00 to £ gold
" " Horse Rasps.....5 25 to £ gold
"Philo Sheffield," P. T. Co.....5 00 to £ gold
Limet & Co. (French).....5 00 to £ gold

Fluting Machines.
Mrs. Coles' Pony..4 in., $4 75; 5 in., $5; 6 in..5 50; 7 in., $6
Knox, with 4-inch Rolls.....4 15 each net
" " 6 " .....4 50 each net
" " 8 " .....6 75 each net
O. K.....6 50 each net
Peerless, 4-inch Rolls.....4 00 each net
" 5 " .....4 75 each net
Excelsior, No. 1.....4 75 each net
" No. 2.....6 50 each net
Diamond.....7 50 each net
Champion, 6 inch rolls.....$5 50 each net
" 4 inch rolls.....$5 00 each net
Climax 7-inch Rolls.....8 00 each net
" 4½ " .....6 50 each net
Empire.....4 00 each net
Eureka, No. 1, 7-inch Roll.....8 00 each net
" No. 2, 5-inch Roll.....6 00 each net
K. F. M., 4½-inch Roll.....5 50 each dis 15 %
6-inch Roll.....6 00 each dis 15 %
Myers' Fashion Fluter, 4½ inch Rolls.....2 75 each net
" Convex Brass Fluter, Sad Iron attachment..$1 75
Domestic Fluter.....$1 50 each net
Fairy, Self-Heater.....60 each net
Geneva Hand Fluter.....$15 00 per doz net

Fluting Scissors......dis 25&10 %

Forges.
Empire" (W. P. Kellogg & Co.).....dis 20 %

Forks.
Hay, Manure & Spading.....dis 33½ %
Plated A 1.....dis 50 %

Fry Pans.
Burnished, P. S. & W., new list.....dis 45 %

₩ doz	$3 00	3 75	4 25	4 75	5 25	6 00	7 00	8 00	9 00
No	0	1	2	3	4	5	6	7	8

Smith, Burns & Co., "Excelsior" Polished.....dis 33 %

₩ doz	$3 70	4 00	4 70	5 30	6 00	7 00	8 00	9 00
No	1	2	3	5	6	7	8	

Gas Stoves.
Tiff & Howard.....dis 20 %

Gauges.
Marking.....dis 45&10 %
Wire.....dis 10 %
" Smith's Patent.....per doz $18 00, dis 40 %

Gimlets.
Nail and Spike.....dis 25&10 %
Double Cut, Shepardson's.....dis 25 %
" " Ives'.....dis 25 %
" " Douglass'.....dis 25&10 %

Grind Stone Fixtures
Sargent's Patent.....dis 65&10 %
Reading Hardware Co.....dis 70&10 %
J. F. Green & Bro.....dis 20 %
Hart Mfg. Co.'s.....dis 60&10&10 %

Hammers.
Emmet Hammer Co.'s Handled.....dis 25 %
" " Sledge & Stone..₩ lb 25 @ 50c net
Humason & Beckley Mfg. Co.....dis 10½&10 %
Maydole's, new list.....dis 5 @ 7 %
Cheney's.....net
Verree.....dis 5 %
Yerks & Plumb.....dis 12½ %
Magnetic Tack.....dis 25&10 %
Warner & Noble's.....dis 10 %

Hand Cuffs and Leg Irons.
Tower's Hand Cuffs, $4 00 per pair.....
" Leg Irons $6 50 per pair.....
} dis 25 %
Providence Tool Co.'s Hand Cuffs $15 per doz
" " Leg Irons 25 " " } dis 10 %

Handles.
Door or Thumb Latches—

Nos.	0	1	2	3	4	
Per doz	$ 80	1 00	1 18	1 35	1 50	—dis 67 %

Boggin's Latches.....40c. @ 50c. net
Brouzed Iron Drop Latches.....per doz $1 00 net
Wrought Chest.....dis 60&10 %
Surface Chest.....dis 65&10&10 %
Flush Chest.....dis 60&10&10 %
Lifting.....dis 60&10 %
Coffin.....dis 50&10 @ 60&10 %
Saw and Plane.....dis 30&10 %
Hammer and Hatchet.....dis 10 %
Brad Awl.....per gross $3 50—dis 2 &10 %
Hickory Firmer Chisel, ass'td " 5 25—dis 2 &10 %
" " large " 6 50—dis 20&10 %
Apple " " ass'td " 6 00—dis 20&10 %
" " large " 7 50—dis 20&10 %
Socket " " ass'td " 3 50—dis 2 &10 %
" Framing " " " 7 00—dis 2 &10 %
File " " " 4 0—dis 2 &10 %
Auger " " " 6 50—dis 20&10 %
" large " 8 00—dis 20&10 %
Patent Auger, Ives'.....dis 25&10 %
" Douglass'.....per set $1 25—dis 10 %
" Swan's.....per set $1 00—dis 10&10 %

Hangers.
Barn Door.....dis 65&10 %
"Anti-Friction" (Elder, Wooster & Co.).....dis 50&5 %
Novelty.....dis 30 %

Harness Snaps.
Henshaw's.....dis 25&10 %
Judd's.....dis 40 %
Fitch's (Bristol).....dis 30 %
Hotchkiss'.....dis 10 %
Andrews'.....dis 25 %
Sargent's.....dis 50&10 %
New York Wire.....dis 2 &20 %

Hatchets.—Isaian Blood.....dis 15 %

Shingling, Nos.	1 2 3	₩ doz	$ 25	8 00	8 50
Claw,	" 1 2 3	₩ doz	7 75	8 50	9 25
Lathing,	" 1 2 3	₩ doz	7 50	8 00	8 50

Hunt's.....dis 10 %

Shingling, Nos.	1 2 3	₩ doz	$7 25	8 00	8 75
Claw,	" 1 2 3	₩ doz	7 75	8 50	9 25
Lathing,	" 1 2 3	₩ doz	7 50	8 25	9 00

Hurd's.....dis 25 %

Shingling, Nos.	1 2 3	₩ doz	$8 00	8 50	9 00
Claw,	" 1 2 3	₩ doz	9 00	9 50	10 00
Lathing,	" 1 2 3	₩ doz	8 00	8 50	9 00

Newark's Edge Tool Co.'s.....dis 25 %

Shingling, Nos.	1 2 3	₩ doz	$6 50	7 00	7 50
Claw,	" 1 2 3	₩ doz	7 25	7 75	8 25
Lathing,	" 1 2 3	₩ doz	6 50	7 00	7 50

Yerkes & Plumb.....dis 15 %

Shingling, Nos.	1 2 3	₩ doz	$7 00	7 50	8 00
Claw,	" 1 2 3	₩ doz	7 50	8 00	8 50
Lathing,	" 1 2 3	₩ doz	7 00	7 50	8 00

Simmon's.....dis 15 %

Shingling, Nos.	0 1 2 3	₩ doz	$7 50	8 00	8 50
Claw,	" 1 2 3	₩ doz		9 00	9 50
Lathing,	" 1 2 3	₩ doz		8 00	8 50
Hand,	" 4 5 6	₩ doz		14 00	16 00
"	" 7 8	₩ doz		20 00	22 00

Elephant.....dis 25 %

Shingling, Nos.	1 2 3	₩ doz	$8 00	8 50	9 00
Claw,	" 1 2 3	₩ doz	9 00	9 50	10 00
Lathing,	" 1 2 3	₩ doz	8 00	8 50	9 00

J. P. Verree & Co.....dis 5 %

Shingling, Nos.	1 2 3	₩ doz	$7 00	7 50	8 00
Claw,	" 1 2 3	₩ doz	7 50	8 00	8 50
Lathing,	" 1 2 3	₩ doz	7 00	7 50	8 00

Underhill's.....dis 10 %

Shingling, Nos.	1 2 3	₩ doz	7 25	8 00	8 75
Claw	" 1 2 3	₩ doz	7 75	8 50	9 25
Lathing,	" 1 2 3	₩ doz	12 00	11 00	13 00

M. H. Jones & Co.....dis 2 %

Shingling, Nos.	1 2 3	₩ doz	$8 00	8 50	9 00
Claw,	" 1 2 3	₩ doz	9 00	9 50	10 00
Lathing,	" 1 2 4	₩ doz	8 00	8 50	9 00

Hinges.
Gate, Western.....₩ doz $6 25—dis 60&10 %
" N. E.....₩ doz 11 25—dis 6 &10 %
" N. Y. State.....₩ doz 7 20—dis 60&10 %
Rolled Plate.....dis 65&10 %
" Raised.....dis 65&10 %
Wrought Strap and T.....dis 33½&10 %
Providence Plate.
{ 6 and 8 in. 11c ₩ lb
{ over 8 in. 9½c ₩ lb } dis 30 %
Screw Hook and Strap.....
{ ⅝, ¾, 12 in. 7c
{ 14 to 36 in 6c } net
Heavy Welded Hook.....
{ ½ to 1 2 in., 6½c
{ 14 in & up, 6c } net
Screw Hook and Eye.....
{ ⅜ in. 9½
{ ½ in. 11½ } net

Hoes.
Solid Shank, C. S.....₩ doz $8 00—dis 25 %
Socket.....₩ doz 9 00—dis 25 %
Riveted Eye.....₩ doz 5 00—dis 25 %
Grub.....dis 25 %
Planters.....net @ dis 5 %
Scovill.....add 25½ %
Scovill Pattern.....net @ dis 5 %
Lane's C. S. Crescent, American Pattern.....list net
" " " Scovill Pattern.....add 10 %

Hooks.
Bird Cage.....dis 60&10 @ 70&10 %
Cotton.....dis 50 %
Belt.....dis 50 @ 60 %
Bench—Hotchkiss' $5 00 ₩ doz.....dis 10 %
" Weston's No. 1, $6 00; No. 2, $7 00 per doz net
" McGill's.....$5 00 per doz, dis 10 %
" Skinner's.....per doz $6 25, dis 20 %
Clothes Line, Hart's list.....d s 60&10&10 %
Harness, Sargent's list.....dis 6 &5&10 %
Wardrobe, Hat and Coat, Reading list.....dis 35&10 %
Ceiling.
Wrought Staples and Hooks and Staples.....dis 70&10 %
Wire Screw Hooks and Eyes.....dis 60&10&10 %
Grass.....dis 2 %
Whittletree—Patent.....dis 30 %
Hooks and Eyes—Malleable Iron.....dis 60&10&10 %
" " Brass.....dis 60&10&10 %

Horse Nails.

	Nos.	5	6	7	8	9	10
American Pressed	₩ lb	32c	30c	29c	28c	26c	26c
Ausable	"	30c	27c	25c	24c	2 c	22c
" Pt'd & Pol'd	"	31c	29c	28c	26c	24c	23c
" & Blued	"	32c	29c	27c	26c	25c	24c
Brundage	"	29c	26c	24c	23c	22c	21c
Buffalo, Forged	"	31c	28c	26c	25c	24c	23c
Globe, Pt'd & Pol'd	"	31c	28c	26c	25c	24c	23c
National, Pointed and Polished, Pat. Fin	"	28c	25c	23c	22c	21c	2 c
National, Pointed and Polished, Ex. Fin	"	30c	27c	25c	24c	23c	22c
New London U. B.	"		29c	27c	26c	25c	24c
" " Great Western	"		27c	25c	24c	23c	22c
Perk ns' Finished	"	30c	27c	25c	24c	23c	21c
Putnam	"	32c	28c	26c	25c	24c	23c
Vulcan, Pt'd & Blued	"	33c	30c	28c	27c	26c	25c

Star brand, 16c.; Morgan.....14c
Putnam.....20.0 lbs., dis 5 %
Ausable, Am. Pressed, Perkins, Globe.
National and New London.....1000 lbs., d's 5 %
Vulcan.....1000 lbs., dis 7½ %
Vulcan and Brunsage.....500 lbs., dis 5 %

Horse Shoes.
Burden.....₩ keg, $4 87½
R. I. Horse Shoe Co., Perkins Pattern.....₩ keg, 4 87½
" " " R. I. Pattern.....₩ keg, 5 87½
Mule Shoes.....₩ keg, 5 87½

Kettles.
Brass.....₩ lb 45c net
Enameled.....dis 30 @ 40 %

Knives.
Ames' Butcher Knives.....dis 20 %
" Shoe " .....dis 15 %
" Bread " .....₩ doz $1 50—dis 15 %
Hay and Straw, "Wadsworth's".....dis 20 %
Table and Pocket.....See Cutlery

Knobs.
Carriage (Jap'd 8 cents per gross).....dis 60&10 %
Base—Common.....net
" Plush Tip.....dis 10 %
" Elastic End, No. 8.....dis 30&10 %
Door, Mineral.....₩ doz $2 25
" Por. Jap'd.....₩ doz 3 00
" " Plated.....₩ doz 7 0
" " Por.....₩ doz 7 0
} dis 45&55&2 %
Furniture, Plain.....75c gross inch, dis 10 %

Ladles.
Melting, Hart's.....dis 55&10 %
" Sargent's.....dis 5 & 0 %
" Reading.....dis 15&10 %

Lanterns.
Tubular.....No. 0, $11 00; No. 1, $14 00 net
Peerless.....No. 8, per doz $11 75—dis 10&10 %
Grady's Patent.....dis 10 & 10 %
Ætna.....dis 10 & 10 %
Yankee.....dis 10 & 10 %
De Beque.....dis 10 & 10 %

Lap Presses.
Draw Cut, 14 inch.....each $65 00—dis 20 %

Lemon Squeezers.
Porcelain Lined.....per doz $7 00, dis 15 %
Eureka, Tinned.....per doz, $ 0 0 dis 10 %
Dunlap's Improved.....per doz $6 00 net

Lines.
Linen Fish.....dis 20 %
Cotton Chalk.....dis 40 @ 45 %
Sil. Lake Chalk.....Nos. 0, 1, 2, 3, $6, 6 50, 7, 7 50, dis 20 %
Mason's.....dis 20 %

Locks and Latches.
Cabinet—Gaylord.....dis 20 %
" Eagle.....dis 2 %
Trunk.....new list dis 25
Langstroth & Crane, Round Key.....dis 4 %
" " Flat Key.....dis 33½ %
Barnes & Deitz.....dis 25 %
Continental.....dis 15 %
Shepardson's.....dis 20 %
American Lock Co.....dis 33½ %
Pinto.....dis 25 %
Yale Lock Co.....dis 40 %
Sargent & Greenleaf.....dis 20 %
Trenton.....
Brunford.....
Norwich.....
Russell & Erwin.....
Norwalk.....
Nashua.....
Mallory, Wheeler & Co.....
P. & F.

Stocks and Dies.....dis 5&10 %
Stone.
Hlungstan Stone.....₱ ℔ 6c
" Axe Stone.....₱ ℔ 8c } dis 20&10 %
" Slips.....₱ ℔ 10c }
Sand Stone.....₱ ℔ 6c—dis 20&10 %
Washita Stone.....No. 1, ₱ ℔ 22c net
" .....No. 2, ₱ ℔ 17c net
" Slips.....No. 1, ₱ ℔ 45c net
Arkansas Stone.....No. 1, ₱ ℔ $1·25 net
" Slips.....No. 1, ₱ ℔ $2·00 net
Grindstones, Family, J. F. Green & Bro.....dis 20 %
Stove Polish.
Joseph Dixon's.....₱ gross, 6 00
Gold Medal.....₱ gross $6 00 dis 25 %
Squares.
Steel.....dis 50 %; full cases, dis 50&10 %
Iron.....dis 50 %; full cases, dis 50&10 %
Nickel Plated.....add $2 50 @ $4 00 ₱ doz net
Try Squares and T Bevels.....dis 45&10 %
Star Try Squares and Bevels.....dis 30 %
Disston's Try Squares No. 1.....dis 20 %
" " No. 2.....dis 40 %
" " Improved.....dis 20 %
Tacks.
Full Weight American Iron.....dis 45&7½ %
Half Weight American Iron.....dis 72½&7½ %
Carpet.....dis 7½ %
Brads American Half Weight.....dis 50&7½ %
Flishing Nails, ½ ⅝ ¾ 1 1¼ in. and over
₱ ℔..... 25c 20c 18c 14c 12c dis 7½ %
Trunk and Clout..... ½ ⅝ ¾ 1 1¼ in. and over
₱ ℔..... 25c 20c 18c 14c 12c dis 7½ %
Copper Tacks.....₱ ℔ 50c—dis 7½ %
Iron Shoe Nails, ₱ ℔ 4-8 and longer, 9½c; 3⅜-8.....
10c.....dis 7½ %
Double Pointed.....dis 33⅓&10 %
Tapes, Measuring.
American Flask and Cap Co.....dis 20 %
Eddy's.....dis 20 %
Tea Trays.
American Tea Tray Co.....dis 15 %
Thermometers.
Tin Case.....dis 50&10 %
Toe Calks.
.....₱ ℔ 13c net
Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 20 %
Wood Bottom.....per doz $12—dis 25&10 %
Ali Iron.....per doz $14·50—dis 25&10 %
Tinners' Tools and Machines.
P. S. & W.....list net
Traps.
Newhouse.....dis 20 %
Peck, Stow & Wilcox.....dis 30 %
Blake's Patent.....dis 30 %
Mouse, Wood Choker.....₱ doz holes, 15 @ 16c
" Patent Cnocker Union Nut Co.).....₱ doz holes 16 @ 18c net
" Round, Wire.....₱ doz $1 50 to 3 00 net
" Square, " .....₱ doz 2 00 to 2 50 net
" Cage, " .....₱ doz 2 50, dis 10 %
Trowels.
Lothrop's Brick and Plastering.....dis 10 %
Disston's Plastering.....dis 12½ %
Disston's Brick.....dis 12½ %
Rose's Brick.....dis 5 %
Brazes' Brick.....gold dis 10 %
Worrall's Brick and Plastering.....dis 30 %
Garden.....dis 25 %
Triers.
Batter and Cheese.....dis 25 %
Ventilators (Window).
Nickel and Gilt.....per dozen $16·00 @ 18 00
Vises.
Trenton Vises, Solid Box.
40 to 160 lbs.....16c
160 and over.....18c
Peter Wright's.....₱ ℔ 15½c. gold
Wilson's Solid Box.....dis 15 @ 20 %
31 to 160 lbs.....18c
160 and upward.....22c
Wilson's Parallel.....dis 30 %
Sargent's " .....dis 30&10&10 %
Backus & Union, Parallel.....dis 25 %
Buffalo, Parallel.....new list dis 25 %
Fisher & Norris' Double Screw Parallel.....dis 15&10 %
Trenton Parallel.....dis 15 %
Merrill's Parallel.....dis 15 %
Parker's.....dis 20 %
Stephens' Parallel.....dis 15 @ 20 %
Bonner's Saw Filers.....per doz $20—dis 20 %
Sears's Saw Filers.....per doz $30—dis 20 %
Wheel Barrows.
Canal (Pugsley & Chapman).....new list dis 12½ %
Coal, Garden and Stone (Pugsley & Chapman).....dis 25 %
Well Wheels.
Revised list.....dis 60&10 %
Wire.
Brass and Copper.....dis 10 %
Bright and Annealed.....Nos. 0 @ 18 dis 40 @ 45 %
" " " 19 @ 26 dis 47½ @ 52½ %
" " " 27 @ 36 dis 52½ @ 57½ %
Covered.....0 @ 18 dis 30 @ 40 %
Galvanized, Nos. 0 to 9.....₱ ℔ 8½ @ 9c net
Galvanized, Nos. 10 to 18.....market list dis 10 @ 15 %
Tinned.....dis 25 @ 30 %
Cast Steel.....dis 15 @ 20 %
Tinned Broom Wire.....dis 30 @ 35 %
Galvanized Telegraph, Nos. 8 and 9.....₱ ℔ 9c @ 9½c
Galvanized Telegraph, Nos. 10 and 11.....₱ ℔ 10c @ 10½c
" " " 12.....₱ ℔ 10½c @ 11c
Annealed Fence, Nos. 8 and 9.....dis 40 @ 45 %
" Grape, " 10 to 14.....dis 40 @ 45 %
Fence Staples.....₱ ℔ 8 @ 8½ %
Iron Steel Wire.....$7 00 to £ gold
Judd's Picture Wire.....dis 50
Clothes Line Wire.....per coil 60c. net
Wrenches.
American Adjustable.....dis 45 %
Baxter's Adjustable "S".....dis 30 %
" Diagonal.....dis 20 %
Collins & Co.'s .....dis 45 %
Coes' Genuine.....dis 40&5 %
" Pattern (Wrought).....dis 50&10 %
" " (Malleable).....dis 60&10 %
Lindsay's Patent.....dis 25 %
Tait's Pattern.....dis 20&10 %
Davis Patent Duplex.....new list dis 25 %
Sems & Call's Patent Combination.....dis 20&5 %
" " Merrick's Pattern.....dis 25&2½ %
" " Brigg's Patent.....dis 15&10 %
Aiken's Pocket.....per doz $10·00—dis 4&10 %

Wringers.	Less than 2 doz	2 doz lots
Providence	₱ doz $54 00	$54 00
Reliance	₱ doz 61 00	59 00
Universal—Extra	₱ doz 64 00	62 00
Novelty	₱ doz 64 00	62 00
Sherman	₱ doz 64 00	62 00
Eureka (Friction)	₱ doz 60 00	58 00

TIN WARE AND TRIMMINGS.

STAMPED TIN WARE, dis 5 %.
COMMON STAMPED WARE, &c.
Bucket Covers.

Inch	½	1	2	3	4
Per gross	4½	5 3-16	6 5-16	6¾	7 11-16
Quarts	$2·00	2·60	3·40	4·25	5·75
Per gross	6	8	10	12	
	8¾	9¼	9¾	10¼	10 9-16
	$6·50	8·00	8·50	11·50	

Cake Box Covers.

Inch	Small.	Medium.	Large.
	11¾	12½	13½
Per gross	$15·00	18·00	22·00

Pot Covers.

Inch	7¾	8¼	8¾	9¼	9¾	10¼
Per gross	$5·75	6·00	6·25	6·75	7·25	9·25
Inch	10¾	11¾	11¾	12¾	12¾	13¾
Per gross	$8·25	9·50	10·00	13·00	13·75	16·50

Pie, Dinner or Scolloped Plates.

Inch	6	7	8	9	10	11
Per gross	$4·00	4·50	5·50	5·00	8·50	10·50

Deep Pie Plates.

Inch	9	10
Per gross	$8·50	10·50

Jelly Cake Pans.

Inch	9	10
Per gross	$7·50	10·00

Coffee Pot Covers.

Plain	1¼	2	3	4	5	6 qts.
Inch	3	3⅜	3¾	4½	5	
Per gross	$1·15	1·40	1·60	2·00	2·75	3·00
Tinned	2¾	3	3¼	4	4½	inches.
Per gross	$2·25	2·50	3·00	3·50	4·00	

T. K. Breasts only.

Inch	7½	8	8½	9	9½	10	10½	11	11½
Per gro.	$5·00	6·50	6·75	7·25	7·75	9·50	10·00	12·00	13·00

Grater Plates.

Sheet	¼	½	1
Per gross	$5·00	6·00	11·50

Scolloped Cake Pans.

	Small.	Large.
Without Tubes	per gross, $8·00	11·50
With Tubes	" 10·50	14·00

Stamped Square Pans.

Sheet	¼	
Per gross	$7·50	14·50

Common Square Pans (One Sheet).

Per gross	$11·50

Milk Skimmers (Plain or Pierced).

Per gross	$4·00

Lettered Plates

Inch	5¾	6
Per gross	$3·25	4·00

Steamer Bottoms.

Add $1 per gross, or 10c. per doz. to list of Pot Covers.
Tin Stove Pipe Rings.

Inch	4	4½	5	5½	6	7
Per gro.	$4·00	4·50	5·00	5·50	6·00	7·00

Add for Burn'd.. " 6·00 6·50 7·00 8·00 9·50 10·00

Coffee Boiler Lips.

Rivet	Small.	Large.
	per gross, $0·80	1·10
Solder	" 1·25	

STAMPED DEEP AND RETINNED WARE, dis 20 %.
Plain Stamped Water Dippers.

Per doz	½ pint.	Pint.	Quart.	quarts.	2½ quarts.
	·90	1·15	1·50	1·85	2·50

Retinned Milk Pans.

Inch	½	1	1½	2	3	4	5	6	8	10	12
Per doz	1·25	1·50	1·75	2·00	2·25	3·15	3·50	3·85	4·75	5·25	5·75

Preserve Bowls, Plain Stamped—

Inch	½	1		Quarts	1	2	2½
Per doz	·50	·75		Per doz	1·00	1·25	1·75

Preserve Bowls, Retinned—

Inch	½	1		Quarts	1	2	2½
Per doz	·75	·95	1·05	Per doz	1·40	1·75	2·25

Pie Pans, Retinned Deep—

Inch	7	8	10	14	17	21	30
Per doz	8·50	9·50	11·00	13·00	16·00	19·00	30·00

JAPANNED TIN WARE, dis 5 %.

Bucketers, Common	Pound	⅛	¼	½	1	2	3
	Per gross	$10·50	15·00	24·00	30·00		
Bucketers, Hinged	Pound	1	1½	2	3	4	
	Per gross	$19·00	25·00	32·00	37·00	42·00	
Bucketers, Square	Pound	2	4	6	8	14	16
	Per doz	$4·00	4·75	5·00	5·75	8·00	9·00

Candlesticks, Japanned.....No. 1 2
Per gross $8·00 7·00
Cake Boxes, Round.....per nest, $2·25
Square.....per nest, 4·25
Chamber Pails, Japanned
Nos.....2 3 4 5
Green, per doz.....$8·00 9·00 11·00 13·00
Oak " .....10·00 11·00 12·00 13·50
Dust Pans, Corrugated.....per gross, $22·00
Box Graters.....per gross, $3·75
Molasses Cups.....Pint ½ 1 2 4
Per gross $15·00 16·00 28·00 42·00
Lunch Boxes, per doz.....7 in $2·00; 8 in. $2 50
Pepper Boxes Japanned..₱ gross small, $3·00; large, $4·00
Toy Banks, House.....No. 1 2
Per gross $7·00 5·50
Toy Banks, Gothic.....No. 1, $6·00, No. 2, 4·00 per gross
Toy Cups, Straight.....No. 1 2 3
Per gross $8·75 3·25 2·75
Toy Cups, Flaring.....No. 1, $4·25; 2, $3·75 ₱ gross
Toy Pails, Covered.....No. 1, per gross $4·00
Toy Rattles.....per gross, $2·00
Trunks, Wire Handled.....per nest (5) $1·75
Spittoons, Tin.....per gross, $27

PLANISHED TIN WARE, dis 20 %.
Planished Coffee Pots, Round.

Each	·60	·75	·85	·95	1·15	1·25	1·30	1·40
Pints	1	2	3	4	5	6	7	8

Planished Tea Pots, Round.

Each	·70	·80	·95	1·05	1·25
Pints	2	3	4	5	6

Planished Tea Pots, Oval.

Each	·70	·80	·90	1·05	1·15	1·40	1·75
Pints	2	3	4	5	6	8	

Planished Pepper Boxes, No. 1.....per doz., $1·52
Planished Flour Dredges, No. 3, $2·10; 4, 2·45 ₱ dozen.
Planished Round Coffee Biggins.

Pints	2	3	4	5	6	8
Each	$1·00	1·10	1·20	1·40	1·60	2·00

Planished Oval Coffee Biggins.

Pints	2	3	4	5	6	8
Each	$1·15	1·25	1·40	1·60	1·80	2·25

Planished Oval Chafing Dishes, Imperial Covers.

Inch	10	12	14	16	18	20	22	24
Each	$3·85	5·00	6·25	7·60	9·00	11·50	15·00	16·50

Planished Oval Chafing Dishes, Low Covers.

Inch	10	12	14	16	18	20
Each	$3·25	4·35	5·20	6·20	7·80	9·25

Planished Low Dish Covers.

Inch	10	11	12	14	16	18	20
Each	$ ·70	·80	1·00	1·25	1·50	2·00	2·75

Planished Imperial Dish Covers.

Inch	10	11	12	14	16	18	20	22	24
Each	$1·55	1·70	2·00	2·60	3·15	3·45	4·60	5·45	6·30

Planished Etnas, on Stands.

Pints	1½	2	3	4	5
Each	$0·90	1·00	1·20	1·50	1·75

Planished Liquor Mixers.....Nos. 0 1 2
Per doz $2·00 2·10 2·45

Planished Oval Melon Molds.

Nos	2	3	4	5	6	7	8	9
Each	$·60	·65	·70	·80	·90	1·00	1·15	1·35

Planished Oval Tumbler Warmers.
To fit 1, 2, 3, and 4 O. G. Urns.....each, $2·50
Planished Oval O. G. Urns.

Nos	0	1	2	3	4	5	6	7	8
Each	$4·00	5·45	6·30	7·00	7·75	9·25	11·25	12·50	15·50

Planished Round Urns.

Nos	0	1	2	3	4	5	6	7
Each	$4·20	4·85	5·45	6·30	7·75	9·00	11·00	14·25

Planished Round Oyster Dishes, (Complete)..Nos. 1 2
Each $2·10 2·80
Planished Oyster Dish Plates.....Nos. 1 2
Each $0·25 0·30
Oyste Dish Covers.....Nos. 1 2
Each $0·30 0·35

Tea Pot Handles—P. S. & W.....dis 20 %
Stow s Patent Hollow Tea Pot Handles.
No. 1, Small, 4¾ inches.....per gross, $11·50
No. 2, Medium, 5¾ " " 12·50
No. 3, Large, 6¾ " " 13·50
No. 4, Ex. Large 7¼ in., for Wash Pitchers &c....." 18·00
Solid iron. Tin Tipped.
No. 10, Small, 4¾ inches.....per gross, $9·00
No. 15, Medium, 5¾ " " 9·50
No. 20, Large. 6¾ " " 10·75
Stow's Patent Hollow Tea Pot Handles, Adamantine bronze—P. S. & W.
No. 12. Bronzed and tin-Tipped.....per gross, $13·50
Asbestos Handles. Or best Malleable Iron.
P. S. & W.....dis 20 %
Japanned.
No. 1, 5¾ inches long.....per gross, $3·50
No. 2, 6 " " 3·75
No. 3, 6¾ " " 4·00
No. 4, 7¾ " " 4·25
No. 5, 8 " " 4·50
No. 6, 9 " " 4·75
Tinned.
Iron Kettle Ears (P., S. & W.).....dis 45 %
Half gross pairs in a package.
Tinned.

Nos	1	2	3	4	5	6	7
Per gross pairs	$3·50	$1·00	1·50	1·75	2·10	2·75	3·75

Black.

Nos	1	2	3	4	5	6	7	8
Per gross pairs	75c	88c	$1·25	1·50	1·75	2·25	2·75	4·00

Tinned Tea Kettle Ears.

Nos	3	4	5	6
Per gross pairs	$1·75	2·10	2·75	

Extra Heavy Tinned Kettle Ears—French Pattern.

Nos	1	2	3	4	5	6	7
Per gross pairs	$1 00	1·25	1·50	1·75	2·00	2·50	3·00

Malleable Iron Kettle Ears for Coal Hods &c.
P., S. & W.....dis 20 %
No. 10 Small.....₱ ℔, Tinned 2c; Black, 16c
No. 30 Medium.....₱ ℔, " 20c; " 16c
No. 40 Extra Large.....₱ ℔, " 20c; " 16c
In cases of 100 lbs. each.
Milk Can or Boiler Handles—(P. S. & W.) 1¼ in..dis 25 %
Plain, 8c.; Japan'd, 9c.; Tinned, 15c. per lb.; Malleable Clips or Ears to match, Tinned.....30c per lb.
Toilet Ware Handles—4½ inches (P. S. & W.).....dis 35 %
Plain with drilled holes, per lb.....8c
Plain with Cast " 8c
Plumbers' Scrapers—(P. S. & W.).....dis 25 %
Extra quality, length 6 in., per doz.....$1·00

METALS.

IRON.—DUTY Bars, 1 to 1½ cents per lb., Sheet, Band, Hoop and Scroll, 1¼ to 1¾ cents per lb. Provided, that none of the above iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 2 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1½ cents per lb.

Pig Iron—AMERICAN.

Foundry No. 1	₱ ton,	$27 00 @ 28 00
Foundry No. 2	"	25 00 @ 26 00
Gray Forge	"	23 00 @ 25 00
White and Mottled	"	
SCOTCH.		
Coltness	...Nominal "	31 00 @ 32 00
Glengarnock	"	32 00 @ 33 00
Gartsherrie	"	31 00 @ 33 00
Eglinton	"	30 00 @ 31 00

Bar Iron.
Am. Rolled, at mill.....nominal.....
Rails.
Welsh, gold.....₱ ton,
American, at works, currency.....
Old Rails.....
Scrap.
Wrought Scrap....." 33 00 @ 31 00
Bar Iron from Store.
Common Iron.
⅜ to 2 in. round and square.... } ₱ ton $57 50 @ 60 00
1 to 6 in. x ⅜ to 1 in..... }
Refined Iron.
⅜ to 2 in round and square.... } " 62 50 @ 65 00
1 to 6 in. x ⅜ to 1 in..... }
1 to 6 in. x ¾ and 5-16..... " 67 50 @ 70 00
Shafting Iron—4½ to 4 in..... " 74 50 @ 82 50
Rods—5-16 to ⅝ round and square.. " 65 00 @ 115 00
Bands..... " 77 50 @ 80 00
Hoops—⅝ to 2 in..... " 87 50 @ 140 00
Swedish Iron.
Ordinary sizes..... " 132 50 @ 135 00
Plow size..... " 145 00 @ 150 00

Sheet Iron.

	Common American and English.	R. G. American.	R. G. English.
Nos. 10 to 20	₱ ℔ 4c	5¼c	5¾c
21 to 24	" 4¼c	5¾c	5¾c
25 to 26	" 4¾c	5¾c	5¾c
27	" 5c	6c	6c
28	" 5¾c	6c	6¾c

Galvanized, 1 to 20, prime, ₱ ℔ 9; 2d quality.....₱ ℔ 8c
" 21 to 24 " " 9¾ " " 8¾c
" 25 to 26 " " 10¾ " " 9¾c
" 27 " " 11¾ " " 10¾c
" 28 " " 12 " " 11c
Patent Polished.....₱ ℔ 11c
Russia, Nos. 8 to 16..... " 16½c
" Stained. No. 1..... " 15½c
Belgian..... " 10c
One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON.

⅛	5	5¼	6	7	inch.
$2·50	3·50	4·50	5·25	6·50	per doz.

RUSSIA IRON.

4½	5	5½	6	7	inch.
$5·00	7·00	9·50	12·00	14·00	per doz.

COPPER—DUTY. Pig, Bar and ingot, 5c.; old copper, 4 cents ₱ ℔; Manufactured (including all articles of which copper is a component of chief value) 45 % ad valorem.
American ingot.....₱ ℔ 23¼ @ 23½c
English " .....

SHEATHING, BRAZIERS COPPER, BOLTS, &C.
Braziers Copper, ordinary sizes, over 16 oz., per square foot.....31c. ₱ ℔
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot.....32c. "
Braziers' Copper, 12 oz. per square foot and lighter.32c. "
Circles less than 24 inch in diameter.....34c ₱ ℔
Circles, 24 inch diameter and over.....37c. "
Segment and Pattern Sheets.....34c. "
Locomotive Fire Box Sheets.....31c. "
Sheathing Copper, over 12 oz. per sq. ft.....30c. "
" 12 oz. ₱ sq. ft. and lighter... 32c. "
Bolt Copper.....31c. "
Copper Bottoms. 38c. ₱ ℔.....net
No Copper in Sheathing except 14x48 inches, and not to exceed 24 oz. to the square foot.

O'NEILL'S PATENT PLANISHED COPPER.
14x48.
14 and 16 oz. and heavier.....37c. By the case, 36c. ₱ ℔
12 oz. and lighter.....40c. " " 39c. "
Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x60
14 and 16 oz. and heavier.....39c. By the case, 32c ₱ ℔
(And all sizes not over 20 inches wide.)
60x60
14 and 16 oz. and heavier.....41c. ₱ ℔
12 oz.....43c. "

TINNING.
14x48, by the case.....6c. ₱ sheet
14x48, less than case.....8c. "
Other sizes not larger than 30x60.....2½c. ₱ sq.
Larger than 30x60.....5c. "
LEAD—DUTY: Pig $1 per 100 lbs.; old Lead, 1½ cent per lb.; Pipe and Sheet, 2½ cents per lb.

Spanish	7c gold
German Refined	6¾c gold
English	6¾ @ 7c gold
American	6 @ 6¾c gold
Bar	8¾c.
Pipe	9¾c.
Tin Lined Pipe	10¾c.
Sheet	10¾c.
Shot	dis 10 %. Drop, 9¾c. Buck. 10¾c.

BABBITT METAL.
N. P. U.....₱ ℔ 9¾ @ 9c
A, 25c.; B, 20c.; C, 15c.; D, 12c. ₱ ℔.
SOLDER.....No. 1 15c; No. 2, 13½ @ 14c
STEEL—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2½ cents; over 7 cents, and not above 11, 3 cents per lb.; over 11, 3½ cents per lb. and 10 % ad val. Railway Bars 1½ cents per lb. Railway Bars, in part Steel, 1 cent per lb. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.

Tool	15 @ 16c
Spring	11c
Homogeneous	12½c
Tire	12½ @ 13½c
Machinery (round and square)	10 @ 11c
File	11c
Sheet	14 @ 16c
Saw Plate, mill and mulay	14 @ 16½c
Saw Plate, gang and X cut	13 @ 14c
" circular as to size	18 @ 30c

Chrome Steel.

Tool	₱ ℔ 20 @ 21c
Tool, extra fine	" 40 @ 75c
Spring	₱ ℔ 12c and upward
Machinery	₱ ℔ 14c
Hammer	" 17c.
Gun or Homogeneous	" 16c

English Steel,—payable in gold, net.

"	Best Cast	₱ ℔ 17¾c
"	Extra Cast	" 14¾c
"	Round Machinery, Cast	₱ ℔ 10¾ @ 11¾c
"	Swaged, Cast	" 19½c
"	Best Double Shear	" 17½c
"	Blister, 1st quality	" 14½c
"	" 2d quality	" 13 c
German Steel, Best		" 11½c
do	2d quality	" 10¾c
	3d quality	" 9¾c
Sheet Cast Steel, 1st quality		" 17½c
" "	2d quality	" 14¾c
" "	3d quality	" 12¾c
File Steel, Flat and ½ Round		" 12½c
"	Square and Round	" 12½c
"	Mill	" 13¾c
"	1-inch	" 16c
"	Taper S and 3¼ inch	" 18c

SPELTER—DUTY: In Pigs, Bars and Plates, $1 50 per 100 lbs.
Silesian, cash.....6¾ @ 7c., gold
American " .....7¼ @ 11c., currency
TIN—DUTY: Plates, Sheets, Tagger and Terne, 1·1c per lb.; Electro-galvanized Plates, 2 cents per ℔; Manufactures of, not enumerated, 35 per cent. ad val. Bars, Rods and Pigs, free. Banca, subject to duty of 10 per cent.
Banca.....₱ ℔ 23¼ @ 24c., gold
Straits.....₱ ℔ 19½ @ 20c., gold
English.....₱ ℔ 19½ @ 20c., gold

CHARCOAL TIN PLATE.

I C 10x14, Prime Charcoal		10·25 @ 10·50
12x12,	"	10·75 @ 11·00
14x20,	"	11·00 @ 11·25
I X 10x14,	"	12·50 @ 12·75
12x12,	"	13·00 @ 13·25
14x20,	"	13·50 @ 13·75
D C 12½x17	"	9·75 @ 10·00
D X 12½x17	"	12·00 @ 12·25
For each additional X add		·75

COKE TIN PLATE.

	Best	2d Quality.	Ordinary.
I C 10x14	$ 9·50 @ 10·00	8·75 @ 9·00	8·25 @ 8·75
I C 12x12	10·00 @ 10·25	9·50 @ 9·75	
I C 14x20	10·00 @ 10·75	10·00 @ 10·25	

TERNE PLATE.

	Prime Char.	20 quat.	Coke.
I C 14x20	$ 9·25 @ 9 50	8·50 @ 9·00	8·00 @ 8·25
I X 14x20	11·75		
I C 20x28	19·50	17·00 @ 18·00	16·50
I X 20x28	24·00 @ 24·50		
I C 20x20	28·25 @ 28·50		

ZINC—DUTY: Pig or Block, $1 50 per 100 lbs. Sheet 2½c. ₱ ℔.

Sheet	cask 10¾c
"	open 10¾c

Old Metals.

(Dealers' Selling Price.)

Copper	@ 20
Yellow metal	14 @ 15
Brass	13 @ 14
Heavy Composition	17 @ 18
Old lead, solid	6 @ 6¾
Tea lead	5
Wrought iron	1½ @ 1¾
Sheet iron	0¾ @
Cast iron	1 @ 1¼
Machinery iron	1¾ @
Zinc	4 @ 5¼
Pewter, No. 1	17
" No. 2	10 @ 12
Spelter	3 @

Paints, Oils, etc.

Paints.

Black, lamp—Coach Painters	₱ ℔ 20c
" Ordinary	16c
" Lever's Drop Ivory	18c
" best	20c
Black Paint, in oil	kegs, 8c.; asst'd cans, 11 c
Blue, Prussian, fair to best	50 @ 75c
" " in oil	35 @ 45c
" Chinese, dry	30c
" Ultramarine	25 @ 35c
Brown, Spanish	1¾c
" Van Dyke	1½c
Carmine, 40	$12 00
Green, Chrome	15 @ 20c
" in oil	18 @ 1 c
" Paris	good, 30c; best, 40c
" " in oil	30c. " 45c.
Mineral Paints	1¾ @ 4c
Orange Mineral	14c
Red Lead, American	9¾c
" English	10¾c
" Venetian (N. C.) dry	2¾c
" in oil	asst'd cans, 11c; kegs, 8¾c
" Indian, dry	11c
Rose Pink	12c
Sienna, American, Raw	4c
" Burnt	4¾c
" " in oil	16 @ 20c
" Raw "	15 @ 20c
Umber, Burnt	4 @ 5c
" " in oil	16 @ 21c
" Raw	3½ @ 4½c
" " in oil	16 @ 20c
Vermillion, Chinese	1 10, gold
" English	1 10 "
" Trieste	1 10 "
" American, Common	25c
White Lead, American, pure dry	10c
" " in oil	11c
White, Paris, English, prime	in bbls. 2½ @ 3c
Yellow Ochre, French	2½ @ 2¾c
" " in oil	asst'd cans, 11c; kegs, 8½c
" " Vermont	in casks 1½c
" Chrome	17 @ 20c
" " in oil	18 @ 20c
Zinc White, American No. 1 dry	8c
" " 1, in oil	11c
" French (Paris)	11 c
" " in oil	12

Oils.

Linseed Raw	₱ gal. casks, 65c. bbls., 68c
" Boiled	" 70c. " 73c
Whale, Crude	"
" Bleached Winter	" 80c
Sperm, Crude	" 1·65
" Winter, unbleached	" 1·90
" " Bleached	" 2·00
Seal, Extra Refined	"
Lard, Pure Winter	" 1·30
" Spring	" 1·20
Cotton Seed, Crude	" 60c
" Southern Yellow	" 65c
" White	"
Neatsfoot, Winter	70c @ $1·10
Natural Lubricating	35c @ 40c

Sundries.

Asphaltum	9c
Benzine	₱ gal. 16c
Chalk	1½c
" Block	
Dryer, Patent, Am'n	asst'd cans, 10c.; kegs 9c
" English	" 11c.; " 9
Flocks	
Frostings	50c
Glue, White	33 @ 45c
" Sheet	30c
Glaziers' Points, Zinc	9c
Gum, Copal	30c
" Damar	25c
" Shellac, English	85c
" " dark	75c
Litharge	11c
Pumice Stone, selected Lumps	4 @ 6c
" powdered	5c
Putty in bladders	3½c
" in bulk	3c
Rotton Stone, soft, English	8c
Spirits Turpentine	34c
Whiting, Spanish	1c

Glass.
French Window—1st, 2d, 3d, and 4th qualities. Per box of 50 feet.
SINGLE THICK.

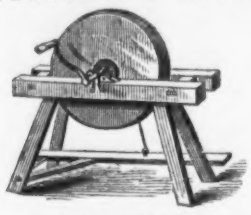
SIZES.	I.	II.	III.	IV.
6 x 8 to 10 x 15	$7·50	$6·75	$6·25	$5·75
11 x 14 to 16 x 24	8·50	7·75	7·25	6·50
18 x 22 to 20 x 30	10·75	9·75	8·75	7·75
15 x 36 to 24 x 30	12·25	10·75	9·00	
26 x 28 to 24 x 36	13·00	11·50	9·75	
28 x 36 to 26 x 44	14·50	13·25	10·75	
26 x 46 to 30 x 50	15·00	14·00	11·25	
30 x 52 to 30 x 54	16·00	14·75	12·00	
30 x 56 to 34 x 56	17·25	15·50	13·50	
34 x 58 to 34 x 60	18·25	17·25	15·00	
36 x 60 to 40 x 60	20·75	18·75	17·25	

DOUBLE THICK.

SIZES.	I.	II.	III.	IV.
6 x 8 to 10 x 15	$12·00	$11·00	$10·00	$9·25
11 x 14 to 16 x 24	13·25	12·50	11 75	10·50
18 x 22 to 20 x 30	17·25

Grindstones, Emery, &c.

Walter R. Wood,
GRINDSTONES.



SOLE AGENT OF THE
BEREA STONE CO., of Ohio.
NOVA SCOTIA and other brands.
283 & 285 Front Street, New York.

Grindstones.
AMHERST,
INDEPENDENCE,
LAKE HURON,
AND BEREA.
Also Scythe Stones.
WORTHINGTON & SONS, Mfrs.,
North Amherst, Ohio.

OIL **STONE**
BOYD & CHASE,
388 to 406 East 107th st., N. Y.,
The largest manufacturers in the world of
ARKANSAS & WASHITA OIL STONE.
Also, *Hindostan, Sand* and *other Stone.*
Send for circular. Orders solicited from the trade. Superior Hindostan Stone finished especially for Retail Trade.

EMERY WHEELS AND MACHINERY
Upon which to run the same, of all kinds.
EMERY Emery Cloth, Mill Stone CEMENT. TRADE MARK. DIAMOND Tools, Oil Stones
Soapstone Register Borders.
For particulars, address,
UNION STONE CO.,
1½ Exchange and 26 Devonshire Streets, Boston, Mass.

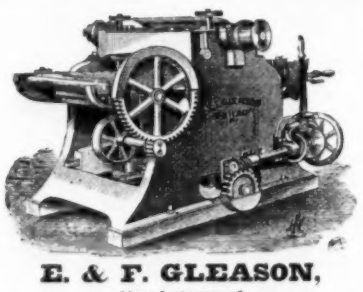
LEHIGH TRADE MARK
THE LEHIGH VALLEY
Emery Wheel Co.,
Weissport, Penn.
Manufacturers of
"LEHIGH" Emery Wheels and Machines.
Send for Circulars.

And Shaped Diamond Carbon Points, indispensable for Turning Emery Wheels, Grindstones, also Truing up hardened Steel and Paper Calender Rollers, &c. Address, J. DICKINSON, Patentee,
64 Nassau Street, New York.

The EUREKA "Perfected"
SELF-ADJUSTING

Simplest, Best and Cheapest Clothes Wringer in the World.
Steel Elliptic Springs.
T. J. ALEXANDER,
General Agent and Manager,
Office, Oliver St. cor. High, Boston, Mass.

SCOTT'S Standard Bellows.



E. & F. GLEASON,
Manufacturers of
IMPROVED WOOD TOOLS.
27 Haydock St., Philadelphia.

L. COES'
Genuine Improved Patent
SCREW WRENCHES.
Manufactured by
L. COES & CO.,
Worcester, Mass.

Established in 1839.
Registered March 31, 1874.

We invite the particular attention of the trade to our New Straight Bar Wrench, *widened*, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to *any* strain the bar may be subjected to.

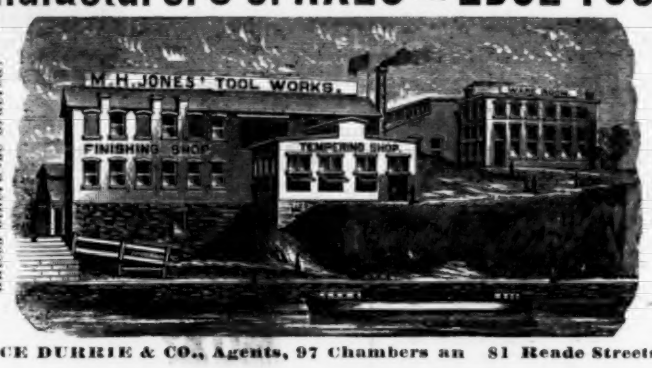
These recent improvements in combination with the nut inside the ferrule firmly screwed up flush, against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the *fact*, that in 1869 we made several *important* improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were *at once closely* imitated and sold as the *Genuine* Wrench by certain parties who seem to rely upon *our* improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be *good* evidence that we manufacture a superior Wrench, we wish the trade *may not be deceived* on the question of *originality*. Trusting the trade will fully appreciate our *recent* efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped

"L. COES & CO."

Warehouse, 97 Chambers St., & 81 Reade Sts., N. Y.
HORACE DURRIE & CO., Sole Agents.

M. H. Jones. A. G. Peck.
M. H. JONES & CO.
COHOES, Albany Co., N. Y.
Manufacturers of AXES AND EDGE TOOLS.

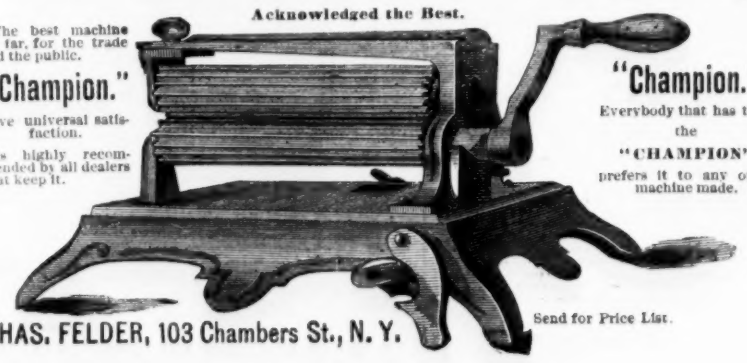


All goods stamped and labeled M. H. JONES & CO. *unless otherwise ordered.*
Sole right to the use of the TEN EYCK AXE PATENT. *Trade Mark*
HORACE DURRIE & CO., Agents, 97 Chambers and 81 Reade Streets, N. Y.

Ausable Horse Nail Co.,
MANUFACTURERS OF
HAMMERED,
Hammer Pointed, Polished & Blued
HORSE NAILS,
FROM
BENZON IRON.
Orders promptly filled at lowest market rates.
ABRAHAM BUSSING, Secretary,
35 Chambers Street, New York.

GLOBE NAIL COMPANY,
MANUFACTURERS OF
Pointed, Polished & Finished Horse Shoe Nails
Recommended by over 20,000 Horse Shoers.
All Nails made from best NORWAY IRON, and warranted perfect and ready for driving. Orders filled promptly and at lowest rates by
GLOBE NAIL CO., Boston, Mass.

Acknowledged the Best.
The best machine by far, for the trade and the public.
"Champion."
Give universal satisfaction.
Is highly recommended by all dealers that keep it.



"Champion."
Everybody that has tried the "CHAMPION" prefers it to any other machine made.
CHAS. FELDER, 103 Chambers St., N. Y.
Send for Price List.

White Lead, &c.

John T. Lewis & Bros.,
No. 231 South Front St.,
PHILADELPHIA.

TRADE MARK.
MANUFACTURERS OF
PURE WHITE LEAD, RED LEAD, Litharge, Orange Mineral, Linseed Oil
AND PAINTERS' COLORS.

TRADE MARK.
The Atlantic White Lead and Linseed Oil Company,
MANUFACTURERS OF
White Lead (Atlantic), Red Lead Litharge & Linseed Oil.
ROBERT COLGATE & CO.,
287 Pearl Street, New York.

Established A. D., 1777.
WETHERILL & BRO.,
Manufacturers of
White Lead, Red Lead, Litharge & Orange Mineral.
Offices, 31st. St. below Chestnut, PHILADELPHIA.

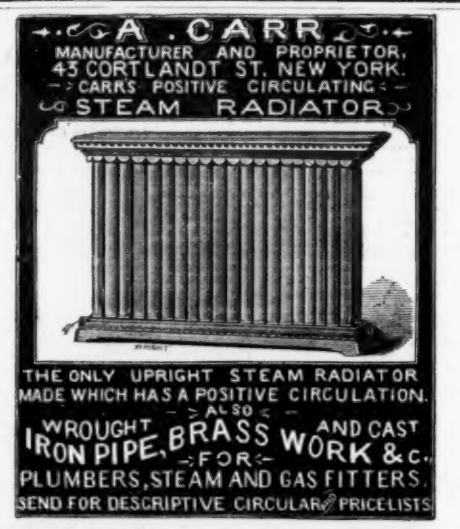
Brooklyn White Lead Co.

BROOKLYN WHITE LEAD CO. INCORPORATED 1825
SUPERIOR PURITY, DURABILITY AND COLOR
ADDITIONAL TRADE MARK.
We caution consumers against the numerous spurious brands, in imitation of ours, of adulterated and grossly counterfeit inferior qualities—which are sold as our LEAD.
$50 Reward for detection of frauds.
F. HOWE, Tr.
Office, No. 89 Malden Lane, NEW YORK.
BROOKLYN WHITE LEAD COMPANY
PREMIUM LEAD
WARRANTED PURE

TRADE MARK.
White Lead, Red Lead and Litharge.
89 Malden Lane, NEW YORK.
FISHER HOWE, Treas.

JOHN JEWETT & SONS
Manufacturers of the well known Brand of
WHITE LEAD.

TRADE MARK.
Also Manufacturers of
LINSEED OIL
182 Front Street NEW YORK


A. CARR
MANUFACTURER AND PROPRIETOR,
43 CORTLANDT ST. NEW YORK.
CARR'S POSITIVE CIRCULATING
STEAM RADIATOR
THE ONLY UPRIGHT STEAM RADIATOR MADE WHICH HAS A POSITIVE CIRCULATION.
ALSO
WROUGHT IRON PIPE, BRASS AND CAST WORK & C.
FOR
PLUMBERS, STEAM AND GAS FITTERS.
SEND FOR DESCRIPTIVE CIRCULAR & PRICELISTS

AMERICAN TWIST DRILL CO.,
Woonsocket, R. I., & 15 New Church St., N. Y.
Sole Manufacturers of the celebrated
Diamond Solid Emery Wheel
Prices: 10x1, $2·00; 14x2, $9·75; 18x2¼, $20·00; 24x3, $42·00.
All other sizes at proportionate prices. State diameter of Holes in your orders for Wheels.
MANUFACTURERS OF
PATENT EMERY WHEEL MACHINERY,
And Automatic Knife Grinders
For the rapid and perfect grinding of Planer, Paper Cutting, Leather Splitting and other long Knives.
These goods are unsurpassed for elegance of design, workmanship, capacity and durability. First premium awarded by American Institute, N. Y., 1870 and '73; Medal and Diploma by M. C. M. A., Boston, 1874.

Fast Cutting—Free from Glazing—It is the best Solid Emery Wheel.

Cor. N. 15 St. & Pennsylvania Ave., Phila.

E. HARRINGTON & SON,
Manufacturers of
ENGINE LATHES,
From twelve (12) to forty-eight (48) inches swing;
Hand Lathes; Wood Turning Lathes; Vertical Drills; Boring Mills; Tapping and Centering Machines; Screw Press for Mandrels
Grindstone Boxes.

HAMMER & CO.,
Branford, Conn.,
Manufacturers of the following *Patented* Articles of
MALLEABLE IRON:
Hammer's Adjustable Clamps.
Hammer's Malleable Iron Oilers.
Hammer's Mall. Iron Hand Lamps.
Hammer's M. I. Hanging Lamps.
For Sale by all the principal Hardware Dealers.
Malleable Iron Castings
Of Superior Quality made to order.

Hardware.

SPEAR & JACKSON

Sheffield, England,

MANUFACTURERS OF

Saws, Files, Edge Tools and Steel.

JOHN L. FISHER. Agent

100 Chambers Street, NEW YORK.

ALFRED FIELD & CO.,

Hardware Commission Merchants,

IMPORTERS AND EXPORTERS.

Principal Offices and Warehouses:

Birmingham, Sheffield & Liverpool, England; New York & New Orleans, U. S.

A large line of Birmingham and Sheffield goods in stock at

93 Chambers St., N. Y., & 75 Gravier St., New Orleans.

HERMANN BOKER & CO.,

OFFICES AND WAREHOUSES:

NEW YORK, 101 and 103 Duane and 91 and 93 Thomas Streets.
REMSCHEID and SOLINGEN (Prussia.) H. BOKER & Co.
SHEFFIELD (England), No. 3 Arundal Lane, Represented by Mr. ARTHUR LEE.
LIEGE (Belgium), Represented by Mr. LOUIS MULLER.

Manufacturers and Importers of **Cutlery, Guns, Hardware** and **Railroad Material.**
Proprietors of **TRENTON VISE AND TOOL WORKS, Trenton, N. J.**—Vises, Picks, Mattocks, Grub Hoes, Sledges, Hammers, Bridge Work, Turn Tables, etc.
Proprietors of the **MANHATTAN CUTLERY CO.,** "O. K." Razors.
Sole Agents for **LAMSON & GOODNOW MFG. CO., Shelburne Falls, Mass.**—Table Cutlery and Butcher Knives.
W. & S. Butcher's Files, Edge Tools and Razors, the largest stock in the United States.
Geo. Wostenholm & Son's Knives, Scissors and Razors, the largest stock in the U. S.
John Wilson's Butcher and Shoe Knives.
Peter Wright's and Armitage Anvils.

We always have on hand a full assortment of

German and English Hardware, Cutlery, Guns, Gun Material, Chains, Heavy Goods.

ROY & COMPANY,

West Troy, N. Y.,

Manufacturers of

Wrought Iron Butts, Strap and T Hinges,

PLATE AND HOOK HINGES,

Cold Pressed Nuts and Washers, Felloe Clips, &c.

CROOKE & CO.,

MANUFACTURERS OF

WROUGHT IRON BUTTS,

All our goods are manufactured from patent faced iron plates; they have a smooth face and bright finish.

163 & 165 Mulberry Street. New York.

FERNALD & SISE, Agents, 100 Chambers Street, N. Y.

CAST STEEL CORN HOOKS.

The blades are polished and ground to Sharp Cutting Edge ready for use. The handles are of first-class timber with square end, and are firmly strapped and rivetted to the Blade, and are as pronounced by the trade the Best and most durable article in the market. Packed in barrels of seven dozen each.

Sole Agents for STANDARD RULE CO.'S

Boxwood, Ivory, Ebon, and Patent Party Color

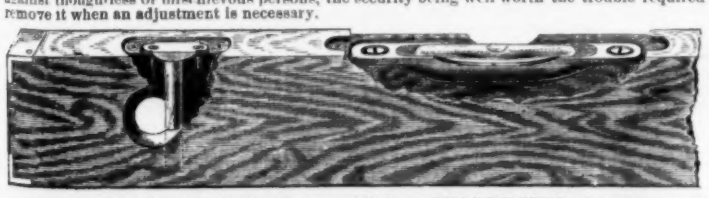
RULES,

Adjustable & Non-Adjustable

PLUMBS & LEVELS.

Their Adjustable Level is the Simplest, Strongest and most Reliable one in the market.

The Spirit Glass is in a metallic case of such a shape at each end as to exactly correspond and bear easily upon perfect curve of a recess formed in the stock for its reception. The case is secured at each end to the stock by a strong screw. When the Level requires adjustment the top plate is removed, one screw is loosened and the other driven until required position is reached. The Plumb Glass is arranged on the same principle. The Top Plate protects the adjustment against thoughtless or mischievous persons, the security being well worth the trouble required to remove it when an adjustment is necessary.



Agents for *COBB & DREW'S* Rivets and Tacks. *RIPLEY MFG. CO.*, Mallets, Mouse Traps, Bung Starts, &c. *ATWATER MFG. CO.*, Carriage Hardware, Clips, Couplings, &c. *VALLEY HARDWARE CO.*, Bow Pins, Ball Rings, Saw Setts, &c. *AMERICAN LOCK MFG. CO.*, Store Door Locks, Padlocks, &c. *R. HUMPHREY & CO.*, Spoons, Ferrules and Tin Washers.

MANUFACTURERS OF

Nuts, Washers, Machine, Stove, Carriage, Plow and Agricultural Bolts, &c., &c.

UNION NUT CO., 78 Beekman Street, N. Y.

Factory, UNIONVILLE, CONN.

CONCORD TRADE (CONCORD USE N.H.) MARK. AXLES

Will Run Easier, carry a Larger Load, and Wear Longer than any other Axle in the Market.

All GENUINE Concord Axles are stamped with above trade mark. Manufactured only by

D. ARTHUR BROWN & CO., Fisherville, Concord N. H.

JOHN WILSON'S CELEBRATED

GRANTED A.D. 1766, BY THE CORPORATION OF CUTLERS OF SHEFFIELD, AND PROTECTED BY ACT OF PARLIAMENT.

BUTCHERS' KNIVES,
BUTCHERS' STEELS,
AND
SHOE KNIVES.

THE TRADE MARK, IN ADDITION TO THE NAME, IS STAMPED UPON EVERY ARTICLE MANUFACTURED BY

JOHN WILSON.

BUYERS ARE SPECIALLY CAUTIONED AGAINST IMITATIONS OF THE MARK, AND THE SUBSTITUTION OF COUNTERFEITS BEARING THE NAME, "WILSON," ONLY.

Works:—SYCAMORE STREET, SHEFFIELD. ESTABLISHED in the Year 1750.

EDGAR'S PAT. "GEM" STOVE SHOVEL.

Strong, Durable, Cheap. Sells at Sight.

For Sale by all *Jobbing Houses.*

EAST RIVER SHEET METAL MFG. CO.

Sole Manufacturers,

253 Pearl Street, N. Y.

KIMBALL'S PATENT

Solid Cast Steel

Shovels and Spades.

Especially Adapted to

Railroads, Turnpikes & Mining.

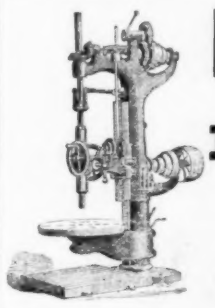
Upon the principle they are made, these Shovels will stand more severe usage and last longer than any Shovel in the market.

Manufactured by

KIMBALL SHOVEL CO.,

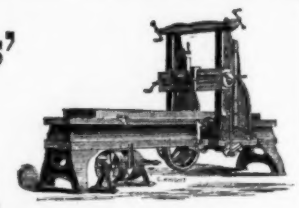
P. O. Box 527. **Baltimore, Md.**

Fitchburg Machine Co.



Manufacturers of

Machinists' TOOLS.



Office and Works,

Sumner Street,

FITCHBURG, MASS.

The American Ice Chisel

Is superseding all others. It will save your time, save your ice, save your refrigerator, save your money. It shave more rapidly than a Crusher, and splits as true as a saw. The blade is of the best English Steel, carefully tempered and plated to prevent rust. Address orders,

THE AMERICAN ICE CHISEL,

100 Chambers Street, or P. O. Box 1402, New York.

VERONA TOOL WORKS.

Metcalf, Paul & Co.,

PITTSBURGH, PA.,

Manufacturers of

RAILROAD TRACK TOOLS

Blacksmiths', Mining and Masons' Tools.

Also the VERONA NUT LOCK,

An Oil-Tempered Steel Spring that takes up Expansion of the Bolt, and keeps a perfectly tight joint. Solid Steel Tamping and Clay Picks.

Portable Pipe & Bolt Threader & Cutter

PRICES FROM $80 UP.

Address, EMPIRE MFG. CO., 48 Gold St., N. Y.

For Sale by

REDFIELD, BOWEN & WALWORTH CO., Chicago, Ills.
BULL & CO., Indianapolis, Ind.
McHENRY & CO., Cincinnati, O.
JOSHUA HENDY, San Francisco, Cal.
REUTER & MALLORY, Baltimore, Md.
WALWORTH MFG. CO., Boston, Mass.
RAHM & HUNTER, Richmond, Va.
LOVEGROVE & CO., Phila, Pa.

RICHARD DUDGEON,

No. 24 Columbia Street, New York,

MAKER AND PATENTEE OF

Hydraulic Jacks and Punches,

ROLLER TUBE EXPANDERS

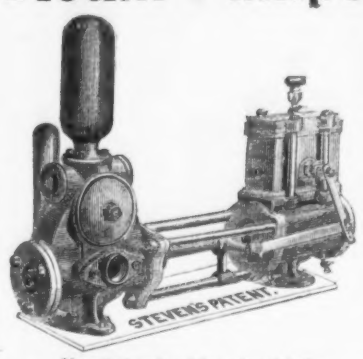
And Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.

JACKS for Pressing on Car Wheels or CRANK PINS made to order

DIRECT-ACTING

Steam Pumps,



Manufactured and for sale solely by

STEELE & CONDICT,

TITAN IRON WORKS, Jersey City, N. J.

Office and Salesroom

88 Liberty Street, New York.

No auxiliary valves used. Direct connection between piston rod and valve movement. No knocking or jarring. Circulars and price lists sent upon application.

The Best Paper! Try It!!

The **Scientific American** is the cheapest and best illustrated weekly paper published. Every number contains from 10 to 15 original engravings of new machinery, novel inventions, Bridges, Engineering works, Architecture, improved Farm Implements, and every new discovery in Chemistry. The Scientific American has been published weekly for 30 years, and stands foremost of all industrial papers. A year's numbers contain 832 pages and several hundred engravings. Thousands of volumes are preserved for binding and reference. The practical receipts are well worth ten times the subscription price. Terms, $3·20 a year by mail, including postage. Specimens sent free. May be had of all News Dealers.

PATENTS obtained on the best terms. Models of new inventions and sketches examined, and advice free. All patents are published in the Scientific American the week they issue. Send for Pamphlet, 110 pages, containing laws and full directions for obtaining Patents.

Address for the Paper or concerning Patents,

Munn & Co., 37 Park Row, New York

Branch Office, cor. F and 7th Sts., Washington, D. C.

CLARK TOMPKINS

Manufacturer and Patentee of

UPRIGHT ROTARY Knitting Machines,

Cone Winders for Hosiery Yarns,

NAPPERS FOR HOSIERY GOODS,

Stop Motions & Alarms for Knitting Machines,

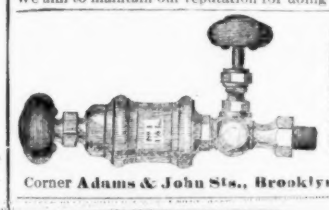
Flock Cutters, and Flock Renovators.

EXTRA PARTS FURNISHED PROMPTLY.

☞ I am also prepared to furnish anything in the line of Gear Cutting from 5½ feet to ⅛ of an inch in diameter, any shape of tooth desired; Racks, Worms, Worm Wheels, Screws any size or number of threads to the inch. Wood Planing, Iron Planing, Large Lathe Work, Gear Cogging, Shafts, Hangings and Pulleys, also all kinds of Mill Work, Jobbing, and Machinery in general.

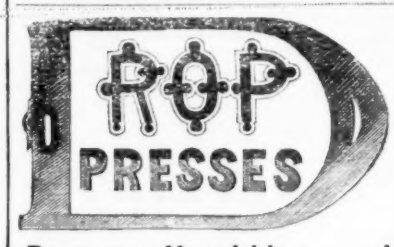
Shop, Foot of Cypress St., Troy, N. Y.

Particular attention paid to Experimental Machinery. We aim to maintain our reputation for doing work well.



CROSSLEY'S Patent Lubricator GLOBE VALVES, &c.

Corner **Adams & John Sts., Brooklyn, N. Y.**



Bennett Hotchkiss and N. C. Stiles' Patent.

This Drop (which has been illustrated in this journal of that class in which the Hammer is raised by a stiff belt or board passing up between two friction rolls, and is so well known that we will only describe our improvements. The patents we are working under are those of BENNETT HOTCHKISS (who in an interference case with Goulding and Cheney was declared the first inventor) and N. C. STILES. Our improvements consist:

First.—Of an arrangement of parts that makes it the most complete Jobbing Hammer, and will take the place to a great extent, of all other kinds for forging. In addition to the upright rod, which is operated by the hammer to open and close the rolls, we place another rod the lower end of which is secured to the end of a lever which is operated by the hand or foot, which operation also opens and closes the rolls at will. The lower end of this rod has a slot, so that the action of the hammer will not disturb the hand lever, thereby preventing the hand being injured, as otherwise would be the case.

Second.—No dog is used on the upright to hold up the hammer. The belt or board passes up between two clamps secured under the rolls, so arranged that as the handle goes up they will freely open of themselves, but on descending they will close and hold up the hammer. To let the hammer fall the clamps are opened by pressure upon the foot treadle.

Third.—The board or belt is secured to the hammer by an elastic connection, which prevents the sudden jar and destruction of the same. The back roll is made adjustable to different thicknesses of board or belt, as also are the clamps. An adjustable collar on the upright rod allows the operator to obtain *any height* of blow desired automatically. If one blow is wanted, press upon the treadle and remove the pressure as soon as the blow is given. Keep the foot upon the treadle and the blows will be repeated until the pressure is removed. If a blow of less hight than the collar is set for is required work the hand lever, which will give you any hight of blow desired. The hammer can be held up at any point below the collar by bringing the hand lever into action when the hammer is at the desired hight, so that the next blow can be given from a state of rest, of less hight than the collar is set for. This is a feature no other drop has; that is, the first blow struck can be of less hight than the second or third, and obtained from a state of rest. A gentle pressure upon the treadle will allow the hammer to go down slowly, but it will stop and remain suspended at any point as soon as the pressure is removed.

The clamps in holding up the hammer keep the board from touching either roll and prevents the same from being worn uneven.

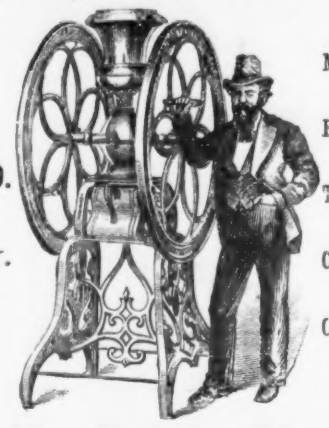
Manufactured only by the

Stiles & Parker Press Co.,

MIDDLETOWN, CONN.

FRANKLIN INSTITUTE OF THE STATE OF PENNSYLVANIA 1824

AWARDED
TO THE
Enterprise Manuf. Co. of Pa.,
PHILADELPHIA,
FOR
AMERICAN
COFFEE, DRUG AND SPICE MILLS.



Measuring Faucets, Bung Hole Borers, Tobacco Cutters, Cheese Cutters, Cork Pressers, &c., &c.

Send for Illustrated Catalogue and Price List
TO
ENTERPRISE MANUFACT'G CO.
PHILADELPHIA, Pa.,
Or to GRAHAM & HAINES, Agents,
88 Chambers St., N. Y.

FRANKLIN INSTITUTE OF THE STATE OF PENNSYLVANIA 1824

THE
BEST and CHEAPEST MILLS
IN THE MARKET.

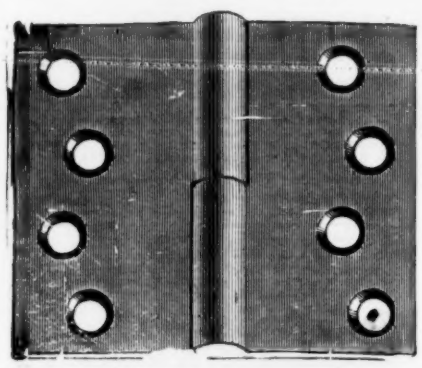
REWARD OF SKILL AND INGENUITY Awarded to Enterprise Mf'g Co. Philada Pa. for Spice & Drug Mills 1874.

No Extra Charge
FOR
NICKEL-PLATED HOPPERS
WITH
EAGLE DOME TOPS.

REWARD OF SKILL AND INGENUITY Awarded to Enterprise Mf'g Co. Philada Pa. for Coffee Mills 1874.

WHEELING HINGE CO.,
Wheeling, West Va.,
Manufacturers of
Wrought Butts, Strap & T Hinges, Wrought Hooks, Hasps & Staples, Wrought Repair Links & Washers,
GRAHAM & HAINES, Sole Agents, 88 Chambers Street, N. Y.

AMERICAN BUTT CO.,
PROVIDENCE, R. I., Manufacturers of
Cast Butt Hinges,
AND
BUILDERS'
HARDWARE.



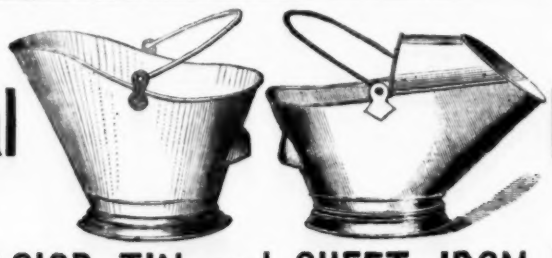
New York Warehouse with
Messrs. GRAHAM & HAINES,
No 88 Chambers Street.
Send for Price List.
All kinds of
SMALL CASTINGS
Made to order.

GREENFIELD TOOL CO.,
Greenfield, Mass.
Sole Manufacturers of the Celebrated
"Diamond" PLANE IRONS,

Of Uniform temper and Warranted. PATENT FORGED OX SHOES. The only Shoe made with concavity to fit hoof. BENCH AND MOULDING PLANES of every description, &c., &c. Drop Forgings to order. Address for Catalogue with stamp. Reduced Prices for 1875.

GEORGE T. RICHARDSON. FRANK H. SCUDDER.
Middleboro' Shovel Co.,
MANUFACTURERS OF
SHOVELS, SCOOPS & SPADES.

Office and Salesroom,
63 OLIVER STREET,
Works Middleboro, Mass. BOSTON.
J. CLARK WILSON & CO., New York Agents, 81 Beekman Street.

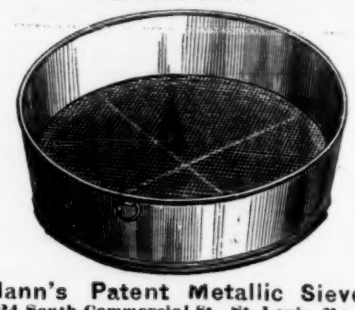
Coal  **Hods.**

EXCELSIOR TIN and SHEET IRON WORKS,
Successors to SMITH, BURNS & CO.,
Manufacturers of Plain, Stamped, Galvanized and Japanned
TIN WARE & SHEET IRON GOODS.
Coal Hods, Fire Shovels, Fry Pans, Water Pails, Well Buckets, &c., &c.
Factory and Warehouse, 47, 49, 51 and 53 South 5th Street, BROOKLYN.
Office and Sample Rooms, 66 Beekman Street, NEW YORK.

COBB & DREW,
Plymouth, Mass.
Manufacturers of Copper, Brass, and Iron Rivets: Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk Clout and Cigar Box Nails, &c. Rivets made to Order
NEW YORK AGENCY
Grundy & Kenworthy
HARDWARE.
165 Greenwich Street.
Agent for the Philadelphia Star Carriage and Tire Bolts

SAMUEL LORING'S
PLYMOUTH TACK AND RIVET WORKS
PLYMOUTH, MASS., manufacturer of
TACKS, BRADS, NAILS AND
RIVETS.
Swedes and Common Iron Tacks; Leathered, Carpet Brush, Lace and Gimp Tacks; Finishing, Hungarian, 3d 2d and 3d Fine, Trunk, Clout, and Cigar Box Nails; Black and Tinned Trunk Nails; Zinc, Iron, Copper and Steel Shoe Nails; Brads and Patent Brads; Glaziers' Points &c., &c., &c., COPPER, BRASS AND IRON RIVETS, of all kinds. Coopers' Rivets, from 1d to 6d, in casks of 100 lbs. each. Hose, Belt and Shoe Rivets and Burs. Oval and Countersunk Heads of extra lengths, made to order. SHIP AND BOILER RIVETS OF ALL SIZES AND LENGTHS

R. J. MANN & CO.
Sole Manufacturers of



Mann's Patent Metallic Sieve,
24 South Commercial St., St. Louis, Mo.
The best sieve in use. To be had of all dealers.
A full assortment of these goods kept in stock at 88 Chambers Street, N. Y.
GRAHAM & HAINES, Sole Agents

FLUTING MACHINES.
The Celebrated K. F. M.
Manufactured for the Trade by
HENRY SOMMER,
8 to 12 Pearl Street, NEWARK, N. J.

Established in 1836.
Shelton Company,
Manufacturers of every variety of
TACKS & SMALL NAILS,
Carriage, Machine, Plow, Stove and Tire Bolts, Coach Screws, Bed Screws, &c.
BIRMINGHAM, CONN

SOLE AGENTS IN NEW YORK.
MOWRY, MASTERS & ANDREWS,
AM. TEA TRAY WORKS,
GREENWICH, N. Y.
TIFFT & HOWARD, 12 MURRAY ST.

SOLE AGENTS IN NEW YORK.
J. F. GREEN & BRO.
Manufacturers of Family Grindstones,
HAVERSTRAW, N. Y.
TIFFT & HOWARD, 12 MURRAY ST.

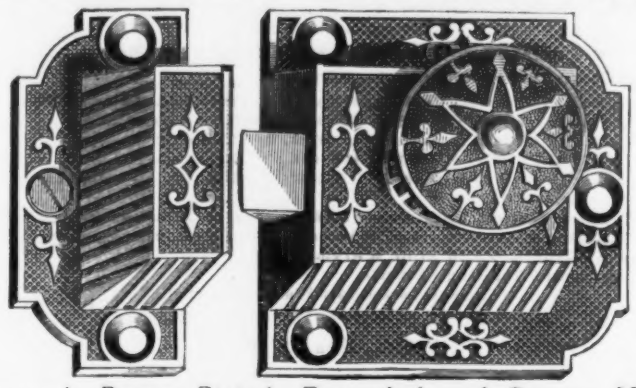
TIFFT & HOWARD,
MANUFACTURERS OF
GAS AND KEROSENE STOVES,
AND PATENTED SPECIALTIES IN
HOUSEKEEPING GOODS,
12 Murray Street.

THE WHITEWATER WAGON
GOVERNMENT STANDARD,
For General Farm, Plantation and Freight Purposes.

The Whitewater Wagon has for many years stood the climatic tests of every section of the country, and on account of its quality of material and workmanship it is now used for the public service by both the United States and Canadian Governments. It may be found in the principal markets of the country, and at prices to compete with strictly first-class work. All timber is seasoned two years before use. Ironing is heavier than any competing wagon. Its style and finish are very superior. A peculiar feature of the skeins gives lighter draft than any other wagon. Send for Catalogues and prices.

WINCHESTER & PARTRIDGE MFG. CO. Works at Whitewater.
Address, SEMPLE, BIRGE & CO., St. Louis, Mo.

The Hart, Bliven & Mead Mfg. Co.,
18 & 20 Cliff Street, and 243 & 245 Pearl Street, New York.
Factories at KENSINGTON, CONN.
MANUFACTURERS OF
BUILDERS' HARDWARE.



Japanned, Brass, Plated, Enameled and Bronze Metal
CUPBOARD CATCHES.
Door Bolts, Sash Fasteners Drawer Pulls, Store Door Handles, &c.,
IN GREAT VARIETY.
Our Catalogue and Appendix is now ready. Price $4·50 and charge remitted on receipt of subsequent orders.

QUACKENBUSH, TOWNSEND & CO.,
Hardware, Cutlery, &c.
59 & 61 Reade Street, N. Y.
Depot for THOS. JOWITT & SONS, (Sheffield, England,) FILES and HORSE RASPS.
Rough & Ready And CLIPPER SCYTHES, Warranted.
Manufacturers of the
CHALLENGE DOOR & GATE SPRING. PATENTED JULY 11TH 1871.
Patented March 4, 1873.
Agents for Norwich Lock MFG. CO.
"BEAVER" (American) FILES and HORSE RASPS.
"WIDE AWAKE" AXES.

R. E. NEIL, President. H. A. LANMAN, Treas. & Manager. F. G. WADDEL, Secretary.
COLUMBUS BOLT WORKS,
COLUMBUS, OHIO,
Manufacturers of BEST NORWAY IRON
Carriage, Steeple, Cone, Shackle, Elliptic, Shaft and Tire
BOLTS
All the different styles used by the manufacturers of the finest Carriages. Every Bolt warranted true to size and fit. Illustrated Price Lists mailed on application. Our facilities are unsurpassed for the manufacture of Machine Bolts and Coach Screws. Correspondence from Car, Bridge and Machinery Builders solicited

Tredegar Horse and Mule Shoes.
These superior Shoes are made of the Best Virginia Charcoal Iron. They are well adapted to Western and Southern demand, and are shipped to all prominent markets at freights as low as other makes.
THE TREDEGAR COMPANY, Manufacturers,
Tredegar Iron Works, Richmond, Va.
SEMPLE, BIRGE & CO., Sole Western Agents, ST. LOUIS, MO.

NEWCOMB BROS.
Manufacturers of
Smiths', Moulders' and Hand
BELLOWS.
For further particulars send for descriptive circular and price list.
586 Water St., near Montgomery N. Y
J. CLARK WILSON & CO., Agents, 81 Beekman Street, New York.

PHILADELPHIA.

(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 0 per cent. per annum.

Anvils.—Solid Cast Steel.....₩ ℔ 14c
Peter Wright's, (Advanced April 1st.) ₩ ℔, gold, 11½c
Wilkinson s..... " 11c
Eagle.....list 11 cents—dis 20 @ 20&10 %
Apple Parers.—Union.....per doz $7 50
Skeleton..... " 7 50
Victor..... " 7 75
Domestic..... " 7 75
Reading..... " 7 75
Bay State Paring, Coring and Slicing..... " 12 00
" " Peach Parers..... " 10 50
Axes.—Mann's Light.....Per doz. $12 00 @ 11 50
Hunt's Light..... " 14 00 @ 12 50
Red Indian, all sizes..... " 12 00 @ 11 50
Red Chiertain, all sizes..... " 12 50 @ 12 00
Crown Prince..... " 12 50 @ 12 00
Augers and Auger Bits.—Pierce's Pat. Twist Bits.....dis 30 %
Douglass' & Ives' Bits.....dis 40&10 %
Connecticut Valley Auger Bits.....dis 40&10 %
Cook s Bits.....dis 40 10&10 %
Jennings' Bits.....dis 10 %
Bates' Nut Augers.....dis 40&10 %
Douglass' & Ives' Augers.....dis 40&10 %
Watrous' Ship Augers.....dis 10&15 %
Konney's Pat. Hollow Augers.....dis 25 %
Stearns' Patent Hollow Augers.....dis 25 %
Balances.—
Landers, Frary & Clark's..... } Sold on Morton's new
Morton's..... } List.....dis 50 %
Chattillon's..... }
Common Spring with Hook..... ₩ doz $1 38 @ 2 00
Bells.—Bevin Bros. Mfg Co. Light Hand Bells.....dis 70 %
Common (Tissue Paper Weight).....dis 70&10 %
Swiss Pattern Hand Bells.....dis 50 %
Connell's Door Bells.....dis 50&5 @ 50&10 %
Gt. Western & Kentucky Cow.. dis 50&10 @ 50 10&5 %
Boring Machines.—Bates' Mfg. Co., complete with augers.....dis 20 @ 25 %
Douglas Mfg. Co., complete with augers..dis 20 @ 25 %
Common Boring Machines, no Augers.....$4 00 @ 3 75
Angular " " ..... 5 00 @ 4 75
Bolts.—Eastern Carriage Bolts .....special prices
Western " " .....
Philadelphia " " .....dis 60 %
" Eagle, (Coleman's).....dis 60 %
Wrought Snutter, Stanley.....dis 50 @ 50&10 %
Braces.—Barber s.....dis 40&5 %
Rackus.....dis50 %
Bartholomew s American Ball... .dis 10&10 @ 15&10 %
Spofford.....dis 50 %
Butts.—Cast Fast Joint, Narrow.... dis 25&10 @ 30&10 %
" " Broad.....dis 35&10 @ 40&10 %
Cast Fast Loose Joint.....dis 45&10 @ 50&10 %
" Acorn, Loose Pin.....dis 40&10 @ 45&10 %
" Mayers & Parliament.....dis 35&10 @ 40&10 %
" Acorn Jap'd.....dis 40&10 @ 45&10 %
Wrought Loose Pin.....dis 35&10 %
" Table Hinges and Back Flaps.....dis 30&10 %
" Narrow.....dis 30&10 %
" Loose Joint.....dis 35&10 %
Parker's Blind Butts..... }
Sheperd s " ..... } Discount 50&10 % by the case
Garretson's " ..... } 60 %.
Clark's " ..... }
Lull & Porter's ..... }
Garretson's Blind Butts Light No. 0..... } Discount 60 %
" " Lull & Porter Pattern..... } By the case
Cherrytree Blind Butts ..... } 60&10 %
Chains.—German Halter.....dis 20 %
" Coil.....dis 20 %
Galvanized Pump..... net 13 @ 13½c
Best Proof Coil Chain—

₩ ℔....	14	10¾	9¼	9	8¾	8½	8c gold
	3-16	¼	5-16	⅜	7-16	½	⅝ in.

By the cask, 500 lbs., ½c per lb. less Common Chain, ¼c per lb. less.
Chisels.—Socket Framing.....dis 60 @ 60&10 %
Socket Firmer.....dis 60 @ 60&10 %
Tang " .....dis 40&10 @ 50 %
Beaty s Framing and Firmer.....dis 20 %
Casters.—Iron Bed.....dis 30&10 @ 40 %
Porcelain Wheel Bed.....dis 30&10 @ 40 %
Iron and Brass Wheel Plate.....dis 40 @ 40&10 %
Porcelain Wheel .....dis 50 @ 50&10 %
Clothes Wringers.—Universal.....per doz $64 00
Noveety.....net 64 00
Discount on 2 dozen lots, $2 per dozen.
Coffee Mills.—Common Box and Side.....dis 15 %
Patent Box and Side.....dis 15 %
Cutlery.—American Pocket (best).....dis 25 %
Landers, Frary & Clark, J. Russell & Co. and Lamson & Goodnow Mfg. Co. Manufacturers' net prices
Drawing Knives.—Hart Mfg. Co. s.....dis 60 %
Adjustable Handle.....dis 10 @ 15 %
Beatty.....dis 15 @ 20 %
Fry Pans.
Tinned.....dis 40 @ 45 %

₩ doz...$3 50	4 00	4 50	5 00	5 50	6 50	7 50	9 00	10 00
No..... 0	1	2	3	4	5	6	7	8

Burnished.....dis 40 @ 45 %

₩ doz...$3 00	3 75	4 25	4 75	5 25	6 00	7 00	8 00	9 00
No..... 0	1	2	3	4	5	6	7	8

Files.
Nicholson Mill Files.....new list
" Bastard..... "
" Taper..... "
Butcher's Mill (Advanced March 8th)....$5 25 to £ gold
" Bastard..... 5 25 to £ gold
" Taper..... 5 25 to £ gold
Fluting Machines.
K. F. M.—4½ in. rolls. $5 50.....dis 15 %
" —6 in. rolls. $6 50.....dis 15 %
Mrs Knox—4 in. rolls, $5 75.....dis 20 %
" —6 in. rolls, 7 00.....dis 20 %
Hammers.
Yerkes & Plumb's.....dis 15 %
Hammond & Son's.....dis 15 %
Veree.....dis 20 %
Hatchets.
Beatty s.....dis 15 @ 20 %

Shingling and Half. { ₩ doz.	$7 00	7 50	7 75	8 00
{ No.....	1	2	3	

Yerkes & Plumb.....dis 15 %

Shingling and Half. { ₩ doz.	$7 00	7 50	8 00	8 50
{ No.....	1	2	3	4

Claw.... { ₩ doz.	$7 50	8 00	
{ No.	1	2	3

Hinges.
Strap and T, (Changed March 24).....dis 45 %
Horse Nails.

Nos.	6	7	8	9	10
Ausable	27	25	24	23	22
Globe	28	26	25	24	23
Brundage	26	24	23	22	21

Nos.	5	6	7	8	9	10
Putnam	32	28	26	25	24	23

On Ausable, Globe and Brundage 1000 ℔ lots.....dis 5 %
Knobs.—Door, Mortise and Rim.
Makes in Combination.....new list dis 45&5 %
Extra discount for cash 2 %
Mineral and Rim.....dis 5 %
Locks and Latches.—Rim and Mortise.... dis 45&5 %
Extra discount for cash 2 %
Till and Cupboard.....dis 25 %
American Padlocks.....dis 50 %
Scandinavian Pad Locks.

₩ doz.....	$10 50	10 50	12 00	12 00	15 00	15 00	} dis 15 %
No.....	9	9¾	10	10½	11	11½	
₩ doz.....	$18 00	18 00	24 00		22 00		} dis 15 %
No.....	12	12½	13		13½		

Trunk Locks.....dis 5 @ 10 %
Thumb and Roggens Latches.....dis 25 %
Lanterns.—Square Candle and Oil.....dis 10 %
Globe for Oil.....dis 10 %
" " Kerosene.....dis 10 %
Tubular Lanterns.....dis 10 %
Mattocks.—Long and Short Cutter.....dis 25 %
Western Pattern.....dis 25 %
Pennsylvania Pattern.....dis 15 %
Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets.....dis 20 %
Stebbins' Gates.....dis 60&10 @ 65&10 %
Lincoln's " .....dis 40&10 @ 50 %
Landers, Frary & Clark's Petroleum.....dis 15&10 %
Taylor's Petroleum Faucets.....dis 20&10 %
Brass Liquor Cocks.....dis 20&10 %
Meat Cutters.—Dixon's.....dis 15 %
Woodruff.....dis 15 %
Stowe.....dis 15 %
Hale's.....dis 25 %
Stuffers.....dis 10 %
Planes.—Auburn Tool Co.. "Bench".....dis 40 %
Second Quality.....dis 50 %
Metallic Plane Co.....dis 25&5 %
Evans Pat. Circular.....net
Plumbs and Levels.
Adjustable.....dis 60&10 %
Non-Adjustable.....dis 60, 10&10 %
Plane Irons.—American.....list net
Butcher's.....gold £, $5 50
Picks.—Philadelphia.....net
Pittsburgh.....net
Rules.....dis 60, 10&10 @ 70 %
Rakes.—Cast Steel Garden.....dis 40 @ 40&5 %
Malleable Garden.....dis 40 @ 40&5 %
Wood Head Iron Teeth.....dis 40 %
Steelyards.—American Pattern.....dis 15 %

₩ doz....	$5 00	7 00	9 00	10 00	11 00	12 00
No.....	50	100	150	200	250	300

English Pattern.....dis 15 %

₩ doz.....	$7 00	8 67	10 67	12 67	14 67	16 67
No.....	50	100	150	200	250	300

L. F. & C. Excelsior.....dis 10 %

₩ doz.....	$9 00	10 00	12 00	15 00	18 00	21 00
No.....	50	100	150	200	250	300

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened.....₩ doz. $10 00 net
Golden Clipper No. 10, Boxed and Sharpened.....₩ doz $9 75 net
Green Clipper No. 5, Boxed and Sharpened.....₩ doz $9 50 net
Common Scythes.....₩ doz $7 50 @ 9 00
Squares.—Steel and Iron, new list.....dis 50 %
Saws.—Disston's Cross Cut.....dis 15 %
Disston's Hand.....dis 12½ %
W. McNiece s H'd. Cross-Cut & Circ'r, new list..dis 15 %
Boynton's Lightning, new list.....dis 40 %
" Champion.....dis 45 %
Shovels and Spades.
Rowland's Plain Back, Jan. 23d.....dis 25 %
" Back Strap " .....dis 25 %
Oliver Ames & Sons.....new list dis 12½ %
Brady Shovel Co.....dis 12½&5 %

Sad Irons.—Richmond (polished face).....per lb. 3¾c
Richmond (polished face)..... by the case " 3¾c
Stone.—Arkansas Oil, No. 1..... ₩ ℔ $1 38
Turkey Oil, No. 1..... " 1 00
Washita Extra..... " 30c
" No. 1..... " 22c
" " 2..... " 18c
" ..... " 5½c
Screws.—Iron.....new list, April 1st, 1875, dis 64½c %
Brass.....dis 52 %
Spoons.—
Plated.....dis 40&10 @ 50 %
Britannia, Boardmans (new list).....dis 50&10 %
" Parkers (old list).....dis 50 %
German Silver.....dis 30 %
" Light.....new list dis 35 %
Lalance & Grosjean Iron.....dis 70 %
Springs.—Gray's Door.....dis 50 @ 50&10 %
Torry's Door.....dis 50 @ 50&10%
Stocks and Dies......dis 10&5 %
Stove Polish.—Gem.....₩ gross, $5 00
Onyx..... " $5 00
Try Squares.—Winterbottom.....dis 10 @ 15 %
Stanley Rule and Level Co.....dis 45&10 %
Willis Thrall, No. 2.....dis 30&10 %
Disston's No. 2.....dis 40 %
Tacks, &c.—Half Weight Tacks.....dis 72½ %
" " by the case...dis 72½&7½ %
Clout and Finishing Nails.....7½ %
Imitation " " " .....dis 30 %
Traps.—Genuine Oneida—Newhouse list.....dis 20 %
Imitation " " " .....dis 30 %
Vises.—Solid Box, currency.....₩ ℔ net 14c
Wrenches.—Coes Genuine.....dis 40 @ 40&5 %
Coes Imitation Wrought Bar .....dis 50&30&10 %
" " Malleable Bar.....dis 60&10 %
" " (Kellogg) Malleable Bar.....dis 65&10 %
Tafts Pattern (Wrought Bar).....dis 70 @ 70&10 %
Philadelphia Tool Co.'s Pat. Duplex.....dis 25 %
" " " Improved Baxter.....dis 25 %
" " " Adjustable Fork.....dis 25 %
Wire.—No. 0 to 18.....(Auvanced April 24th).....dis 40 %
No. 19 to 26..... " " .....dis 47½ %
No. 27 to 36..... " " .....dis 52½ %
Coppered 0 to 12.....dis 15 @ 20 %
Tinned Broom Wire.....dis 25 %
Galvanized Wire No. 1 to 18 .....dis 40 %

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.

June 1, 1875.

Augers—Snell Mfg. Co.....dis 25 %
Bits, Auger—Snell Mfg. Co.....dis 25 %
Phœnix .....dis 25 %
Bells, Cow—Yaw s Genuine.....dis 40 %
Bells—Carriage and Tire.....dis 30 %
Braces—Bit, Spofford's Patent.....dis 75&5 %
Brads, Cut.....dis 50 %
Boards—Stove, Brooks' Patent.....dis 30&7½ %
Butts—Brass.....dis 35 %
Wrought Narrow.....dis 30 %
" Broad, Loose Joint.....dis 30 %
" Table and Back Flaps.....dis 35 %
Wrought Butts, Loose Pin.....dis 30 %
Belting—Rubber.....dis 35 %
Leather, new list, oak tanned.....dis 30 @ 10 %
Brick—Bath (box of 2 doz) Best English.....dis 30 %
" Rutherford $1 25
Can Openers—Sprague's.....$1 00
Cases—Flor Coal Hod.....dis 50 %
Chalk—White, Carpenter s .....dis 10 %
Red, Carpenter's ..... ₩ gross, 57c
Blue, " ..... " 90c
Chisels—Firmer Socket.....dis 60, 10&10 %
Framing Socket.....dis 60, 10&10 %
Corner Socket Chisels.....dis 60, 10&10 %
Slick's Carpenters'.....dis 60, 10&10 %
Castings—Malleable .....dis 60, 10&10 %
Egg Beaters—" Peerless".....₩ ℔ 10c
" Centripetal' .....per doz $3 60
Elbows—Corrugated..... 5 5½ 6 7
Charcoal.....$3 50 4 50 5 25 6 50 } dis 10 %
Russia..... 7 00 9 50 12 00 14 00 }
Files—Malschoss Bros.....dis 50 %
Fluters—Geneva Hand.....dis 50 %
Freezers Ice Cream—" Champion .....₩ doz. $15 00
Hammers—Henry W. Kip's.....dis 33⅓ %
Hinges, Gate—Shepard's.....dis 7½ %
Hinges—Window Blind—.....dis 40&10 %
Sheperd's and Standard.....
Wrought Strap and T.....dis 60&10 %
Hods, Coal—Plain ,Black and Galvanized.....dis 33⅓&10 %
Funnel, Black and Galvanized.....dis 10 %
Fancy and Helmet.....dis 10 %
Sad Irons.....dis 10 %
Kettles—Brass.....3¾c
Copper, " Hand Made".....₩ ℔, 45c
Enameled.....dis 40 @ 45 %
Knives, Drawing—Oval No. 1.....dis 50&10 %
Razor Blade .....dis 60, 10&10 %
Lanterns " Peerless. .....dis 60&10 %
No. 1 5 10
Tubular..... ₩ doz $26 00 $10 50 $13 75 dis 10 %
" with Guards.....$11 00
Machines—Apple Paring, "Turn Table".....7.75 ₩ doz
Machines, Boring—Snell's.....dis 20 %
Mills, Coffee—Box and Slide, common.....dis 15 %
Box Union and Eagle.....dis 15 %
" American .....dis 20 %
Molasses Gates—" Self Measuring".....dis 20 %
Nails—Clout and Finishing.....dis 7½ %
Shoe.....dis 7½ %
Horse, Ausable.....No. 5 6 7 8 9 10
30 27 25 24 25 22c
" " Pointed & Polished.....add 1c ₩ ℔
" " 1000 lbs.
" Clinton.....No. 5 6 7 8 9 10
21 19 18 17 16c
Packing—Rubber.....dis 30 @ 10 %
Paint—White Lead, U. S. Gov't.....₩ ℔ 8½c
Rivets—Iron, Black and Tinned.....dis 25&7½ %
Rope—Manila, ½ inch and larger.....₩ ℔ 14½c
Sisal, ½ inch and larger.....11½c
Jute, all sizes.....9½c
Screws—"American Screw Co"—
Flat Head, Iron.....dis 62½ %
Flat Head, Brass.....dis 52½ %
Skates and Straps—White's.....dis 20 %
Spoons, Iron Tinned.....dis 10 %
" by the case.....dis 20 %
Plated Rogers' A No. 1.....dis 50 %
Britannia.....dis 50&5 %
Squares—Steel and Iron.....new list 50 %
Scales—Buffalo Scale Works.....dis 25 %
Fairbanks.....dis 15 %
Stove Polish—Gem.....₩ gross, $4 50
" Dixon's.....6 00
Trans. Steel—Newhouse.....dis 20 %
Tacks—Half Weight Am. Iron.....dis 72½&7½ %
Vases—Palace Ccal.....dis 10 %
Vises—Parallel, Buffalo.....dis 30 %
Ware—French, Tinned and Iron.....dis 25 %
Stamped and Japanned.....dis 5 %
Cast Iron Hollow.....dis 33⅓ %
Tin Plates.—Add 50 for each X.....2 50
10x14, IC, Charcoal...$11 00 , 14x20 C, terne.....$10 00
12x12, " ... 11 50 20x28 C, " ... 20 50
12½x17, " ... 11 00 20x28 X, " ... 25 00
14x20, " ... 12 00
Pig Tin—Straits.....25c @ 26c
Bar Tin.....27c
Solder—No. 1, Crook's.....16½c
Refined, No. 1, 15½c; No. 2.....14½c
Sheet Zinc—
" Lasalle '.....570 100 ℔ casks
$10 75 11 05 ₩ 100 ℔s
Sheets.....$10 75
Iron Wire—Bright and Annealed.....dis 45 %
Coppered.....dis 40 %
Tinned.....dis 25 %

Tinned Broom, { Nos.	20	21	22	} dis 30 %
{	20c	21c	21c	

Copper—Sheathing 14 @ 18 oz.....₩ ℔, 30c
Planished.....₩ ℔ 37c @ 39c
Bottoms.....₩ ℔ 38c
Bolts.....₩ ℔ 31 @ 33c
Braziers' Sheets.....₩ ℔ 31 @ 33c
Sheet Iron.—
18 Common.....$4 30
24 Common.....4 50
24 W. D. Wood & Co., Smooth Finish.....5 30
Am. Russia..... A. 14c B. 11c
Gen. Russia, No. 1 stained.....16½c
" " clean.....14½c
Galvanized.....dis 35 %
Galvanized Iron.—Full bundles.....dis 25 %
Nos. 18 to 20.....12c No. 26.....14c
22 to 24.....13c 27.....15c
Bar Steel.—Silver, ₩ ℔ 16c; Crescent, 21c.
Iron Wire.....dis 35 %
Enameled Ware.....dis 45 %
One Piece Corrugated Elbows.....dis 10 %

Charcoal Iron.		Russia Iron.	
4½ inch.....	₩ doz $2 50	4½ inch.....	₩ doz $5 00
5 "	" 3 50	5 "	" 7 00
5½ "	" 4 50	5½ "	" 7 50
6 "	" 5 00	6 "	" 12 00
7 "	" 6 50	7 "	" 14 00

Leader Elbows, Flat Crimp Retinned or Galvanized.—Dis. 10 %

	₩ doz.		₩ doz.
2-inch.....	$1 75	2½-inch.....	$2 75
3-inch.....	2 25	3½-inch.....	3 25
4-inch.....	2 50	4½-inch.....	3 50

Sheet Iron Bread Pans.....₩ ℔ 10c
American Broilers.....₩ doz. $13 50
Tinmen's Machines.....dis 5 %
Sad Irons.....₩ ℔, 3½c
Brass Kettles.—Ansonia.....48c
Dog Irons.....4 c

PITTSBURGH.

The following are the Card rates of Lewis, Oliver & Phillips, H. B. Newhall, 11 Warren St., New York, Agent.
Iron, standard list assorted sizes, for large orders, c, card rate, 2 % off net.
Flat Rail (1¼x¼), punched and coun'sunk..4¼c ₩ ℔ net
Iron Wedges.....4¼c ₩ ℔ net
Norway Nail Rods.....9¼c ₩ ℔ net
Crow Bars (in ordering please state whether "Wedge" or "Pinch" point).....5c ₩ ℔ net
Beetle Rings.....8¾c ₩ ℔ net
Fence Pickets—
⅝ round, bent to shape, 30c ₩ ft. of fence, less 15 % off net.
Discount off Standard List.
Carriage and Tire Bolts (new list).....70&10 % off net
Plow Bolts.....30, 10&5 % off net
Stove Bolts.....15 % off net
Machine and Square Head Bolts.....30&10 % off net
Coach and Lag Screws.....30&10 % off net
Bolt Ends.....35 % off net
Pat. Hot Pressed Square and Hexagon Nuts, small sizes, from 3-16 to ⅜ in.....7½c ₩ ℔ off net
Pat. Hot Pressed Square and Hexagon Nuts, large sizes, from 7-16 to 2 in.....6 c ₩ ℔ off net
Washers, all made from new band iron, small sizes, from 3-16 to ⅜ in.....9 c ₩ ℔ off net
Washers, all made from new band iron, large sizes, from 7-16 to 1¾ in.....7 c ₩ ℔ off net
Nuts and Washers in 25 lb. boxes, 1c ₩ ℔ ex. Nuts and Washers in lots less than one keg each size, 1c ₩ ℔ ex. Nuts and Washers in 5 lb. boxes, 1½c. ₩ ℔ ex.
Harrow Teeth, in lots of 1 ton or more, packed in casks, 1 in. diam. 3¼c ₩ ℔ net; ⅞ in. diam. 3¼c ₩ ℔ net; ¾ in. diam. 4c ₩ ℔ net.
Patent Headed Harrow Teeth, packed in casks, ¼c ₩ ℔ ex
Skein Bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 5¼c ₩ ℔ net; 9-16 in. diam. 6¼c ₩ ℔ net; ½ in. diam. 7¼c ₩ ℔ net. 1c ₩ ℔ extra when less than 1 keg of each size is ordered.
Screw Hook-and-Eye Hinges, ¾ to 1 in. diam. 9c ₩ ℔ net; ⅝ in. diam. 10c ₩ ℔ net; ½ in. diam. 12 c ₩ ℔ net.
Screw and Strap Hinges, in lots of 100 pairs or more, 14 in. long, 5¼c ₩ ℔ net; 8, 10 & 12 in. long, 6¼c ₩ ℔ net
Strap and T Hinges.....20 & 10 % off net, delivery as customary.
For purchases amounting to $250 between May 30th and December 31st, 5 % extra off.
Screw Hitching Rings.....$5 25 ₩ 100 net
Duck Nest Tuyere Irons.....$14 50 ₩ doz net
Cast Iron Washers.....₩ ℔ 4c net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long..... ₩ ℔ 4 c net
1 to 2 in. diam. from 4 to 8 ft. long..... " 4¼c net
1 to 2 in. diam. from 1¾ to 4 ft. long..... " 4¾c net
⅞, ¾ and ⅝ in. diam. over 4 ft. long..... " 4¾c net
⅞, ¾ and ⅝ in. diam. from 1¾ to 4 ft. long " 5¼c net
Bridge bolts with upset ends.....¼c. ₩ ℔ extra
Wrought iron plates, punched.....5c. ₩ ℔ net

WAGON HARDWARE.

Wagon Box Strap Bolts—
10 in. long by 7-16 at Screw End, ₩ set of 8 bolts.. 55c
12 " ½ " " 8 " .. 70c
10 " 9-16 " " 8 " .. } 90c
12 " 9-16 " " 8 " ..
14 " 9-16 " " 8 " .. } $1 00
10 " ⅝ " " 8 " ..
12 " ⅝ " " 8 " .. } 1 00
14 " ⅝ " " 8 " ..
16 " ⅝ " " 8 " .. } 1 20
5c ₩ set for each additional inch over 14 in. All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.
Wagon Box Rods, narrow track, each.....18c
" " wide track, each.....20c
Single Tree Irons, ₩ set of four pieces.....35c
Wrought Iron Bolster Plates, 2¾ in. wide, ₩ set.....60c
" " 3 " " 65c
" " 3½ " " 70c
" " 3¾ " " 75c
Wagon Brake Ratchets, each.....16½c
" " " finished with guard, each..45 c
Wrought Hammer Straps, heavy pattern, each.....16 c
" " light " each.....13½c
" Rub Irons, each.....11 c
Stay Chain Hooks, each.....8 c
Double and Single Tree Clips, figure 1, each.....9 c
" " " 2, each.....10 c
" " " 3, each.....12 c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks and Clips, in lots of 50 sets.....dis 25 %
Wagon Box Staples, 1¾ to 2¾ in. to clinch, ₩ 1000 $11 00 net
" " " Bevel Box Iron, to rivet on, ₩ 1000 7 50 net
Neck Yoke Eyes, each.....4¼c net
" " " with ⅝ rings, each.....7¼c net
King Bolts, ⅝, 1, 1¼, and 1¼ in. diam.....₩ ℔ 4¾c net
Wagon Rivets, ex. large, flat, oval and steeple head, ¼ in. diam. all lengths..... " 8¼c net
Wagon Rivets, 3-16 in. diam., all lengths..... " 9¼c net
" & Nails, in 5 ℔ paper boxes....₩ ℔ 1c extra
" " in 25 ℔ wood " .... ¼c extra
Wagon and Hinge Nails, ¾ in.....₩ ℔ 17 c net
" " " 3-16 in..... " 19 c net
Double Tree Plates..... " 8½c net
Coupling " ..... " 5½c net
Tongue " ..... " 9 c net
Neck Yoke Plates..... " 11 c net
Tongue Cap Iron, 1¾, 2 & 2¾ in. wide, same price ₩ ℔ as Band Iron.
Wagon Chains, Stay Lock and Tongue, 5-16 in, ₩ ℔ 10½c net. ¼ in., 11½c. net

DETROIT.

(Reported by Messrs. Jewett & Root.)

Tin Plate.—Best Charcoal
IC, 10x14.....$11 50
IX, 10x14.....13 25
XX, 10x14.....14 00
IC, 12x12.....12 00
IX, 12x12.....14 75
IC, 14x20.....14 50
IX, 14x20.....16 25
XX, 14x20.....18 00
XXX, 14x20.....20 75
XXXX, 14x20.....23 50
DC, 100 Plate.....11 00
DX, " 13 75
DXX, " 16 50
DXXX " 19 25
DXXXX 100 Plate..22 00
IX, 14x14.....23 25
IC, 10x14 W.....11 00
IX, 10x14 W.....14 75
Roofing Tin.—Best Char.
IC, Terne, 14x20.....$10 50
IX, " 14x20.....13 25
IC, Terne, 20x28.....22 00
IX, " 20x28.....27 00
Coke Tin.—
IC, 10x14 Coke.....$10 00
IX, 10x14, Coke 12 75
IC, 14x20, " 11 00
Pig Tin.—
Large Pigs.....29c
Small Pigs.....29½c
bars.....30c
Solder.—No. 1.....16c
No. 2.....15c
Sheet Zinc.—
In any quantity.....10½c
Bright Wire.
65 lbs. in bdl.....dis 40 %
Copper.—
Sheathing.....31c
Copper Bottoms.....32c
Planished Copper.—
Sheathing, 14x48.....38c
Boiler Size, No. 7.....40c
" " No. 8.....40c
" " No. 9 .....40c
Sheet Iron.—
No. 18 Am. Com.....4 40
No. 24 Am. Com.....4 60
No. 26 Am. Com.....4 80
Patent Planished Russia, Nos. 24, 25 and 26.....14c
Genuine Russia, No. 9, 10, 11 and 12.....18c
Broken bdls. ¼c. extra.
W. D. WOOD'S & CO. S SHEET IRON.—
Nos. 15 to 20 Smooth $5 10
" 21 to 24..... 5 30
" 25 & 26..... 5 50
" 21 to 24 Char'l.. 6 80
" 25 & 26 " .. 7 00

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street.

Tin Plate.—I. C. 10x14 Charcoal.....$12 00 @ 13 00
I. X. 10x14 Charcoal..... 14 50 @ 15 00
I. C. Terne 14x20..... 10 50 @ 12 50
I. C. Terne 20x28..... 22 00 @ 23 00
I. C. Continuous..... 23 00
Block Tin.—
Pig.....₩ ℔ 28c
Bars.....₩ ℔ 31c
Solder.—
A 1.....₩ ℔ 18c
Roofing.....₩ ℔ 17c
S. & Co.....₩ ℔ 23c
Lead.—Pig.....₩ ℔ 7½c.
Bar.....₩ ℔ 8½c
Copper.—
Ingot.....₩ ℔ @ 24c
Planished..... " @ 39c
Sheathing..... " @ 33c
Copper Drops..... " @ 33c
Sheets, 6 to 9 ℔..... " @ 38c
" 10 to 12 oz..... " @ 35c
Braziers, 13 lb..... " @ 32c
Copper Bottoms..... " @ 33c
Zinc. Casks, 500 to 1000 lbs.....₩ ℔ 10½c
Case, 100 lbs..... " 11 c
Slab..... " 7½c
Brass.—Roll, No. 6 to 30.....₩ ℔ 30c
Roll, No. 30 to 38..... " 33c
Wire, No. 0 to 20..... " 35c
" 20 to 25..... " 40c
Babbit Metal.—Sellew & Co..... " 35c
Aliens'..... " 40c
Market..... " 12c
Antimony.....₩ ℔ 17c
Bismuth.....₩ ℔ $4 00
Nickel.....₩ ℔ $3 50
Sheet Iron.—Gen. Russia.....₩ ℔ 20c
Planished A.....₩ ℔ 14c
" B..... " 12½c

	Com. B.	Smooth Fin. S. I. U.	Smooth D Re'fd.
15 to 20.....	4 3-10	5 5-10	7 5-10
22 to 24.....	4 4-10	5 4-10	7 4-10
26.....	4 50	5 50	7 5-10
27.....	4 75	5 75	7 75

Send 50 cents for 6 samples (Prepaid) of

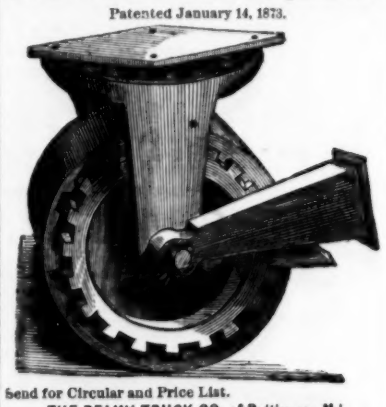
HAMMOND'S WINDOW SPRINGS,

For supporting and locking upper and lower sashes of all windows. Not a coiled spring, but one *forged* from best materials. **W. S. HAMMOND, Lewisberry, York Co., Pa.**

Gold Medal at Md. Ins. Exposition, Oct. 1874.

Er dless-Lever House & Weight Mover.

Patented January 14, 1873.

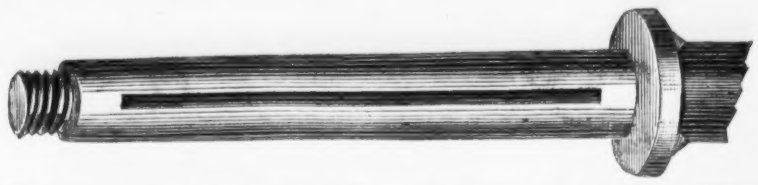


Send for Circular and Price List.

THE REAMY TRUCK CO. of Baltimore, Md. Incorporated, Oct., 1874. Reliable State Agents Wanted.

Guy C. Hotchkiss, Field & Co.,

85 First St., Brooklyn, E. D., and New York City.



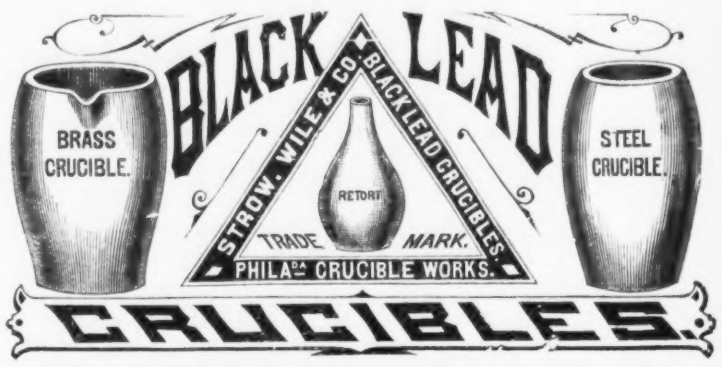
We call the attention of the Hardware trade to our specialties in **CARRIAGE MAKERS' MATERIALS and MACHINES.**

Axles of Superior Quality of all Styles

lower than any manufacturers in the country.

Lubricating Axles, as per, cut have proved superior to any other style; the continuous recess catches all foreign substances which may gather inside the box, and also serves as a receptacle for lubricating compound until drawn out by the attraction pro luced by the revolution of the wheel. It being placed in the central upper part of the axle, there is no possibilty of small fragments working down the sides of the arm and grinding, as experiment has proved, occurs on axles made with detached recesses distributed over the upper surface of the arm. Springs all grades at lowest market prices.

Bolt Cutting Machines, Drills, TIRE BENDERS, all styles, from $7 to $50, less trade discounts. **Drills, &c., &c.**



FOR MELTING ALL KINDS OF METALS,

And Manufacturers of

Sunny Side Stove Polish.

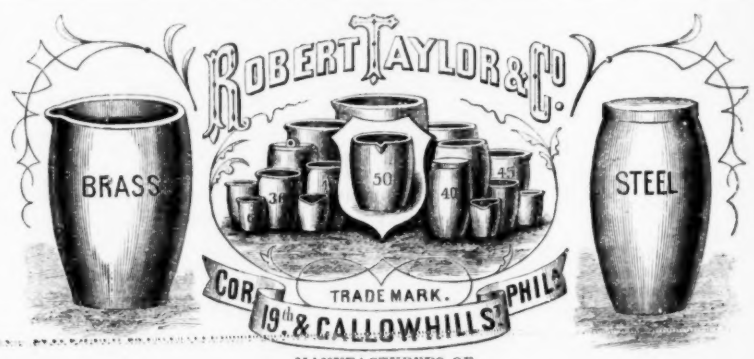
Lumber Pencils, Foundry Facings and Lubricating Plumbago.

STROW, WILE & CO.,

Nos. 1324, 1326, 1328, 1330, 1332 & 1334 Callowhill St., Phila

GENERAL AGENTS:

Messrs. HALL & CARPENTER, 709 Market St., Phila.



MANUFACTURERS OF

BLACK LEAD CRUCIBLES

Of all Sizes and Forms for melting

Steel, Brass, Gold, Nickel and all kinds of Metals.

Mr. Robert Taylor, who was for seven years the head of the late firm of Taylor, Strow & Co., and who is a practical mechanic, and familiar with all the details of the manufacture of Crucibles, attends personally to our manufacturing department. We would, therefore, respectfully solicit a continuance of the favors hitherto extended to him.

ROBERT TAYLOR & CO.,

No. 1900, 1902, 1904 & 1906 Callowhill, St., Philadelphia.

General Agents, { MERCHANT & CO., 507 Market Street, Philadelphia. PARK & CO., 122 Second Avenue, Pittsburgh, Pa.

BUSH HILL IRON WORKS,

Corner 16th & Buttonwood Streets,

PHILADELPHIA.

JAMES MOORE,

(Successor to MATTHEWS & MOORE,)

Engineer, Machinist, Founder and Boilermaker

CASTINGS of every description.

ROLLING MILL AND FURNACE EQUIPMENTS COMPLETE

Rolls Turned for Rails, Beams, Angles, and all shapes for Iron, Steel, or Composition Metals.

Sugar Mill, Saw Mill and Grist Mill Machinery,

AND MILLWRIGHTING IN GENERAL.

BOILERS—FLUE, TUBULAR AND CYLINDER, and all kinds of TANK AND PLATE IRON WORK.

Steel.

THREE 1st. CLASS PRIZE MEDALS, CLASSES 1, 21, 22, Great Exhibition of Industry LONDON, 1851.

MEDAL OF HONOUR, SOCIETY OF ARTS & INDUSTRY, LONDON, 1856.

1st CLASS PRIZE MEDAL, CLASS 1st UNIVERSAL EXHIBITION OF INDUSTRY PARIS, 1855.

COCKER BROTHERS,
(Limited.)
SUCCESSORS TO
SAML. COCKER & SON,
(Established 1752.)
SHEFFIELD, ENGLAND

MANUFACTURERS OF
CAST, SHEET, AND BLISTER STEEL, OF EVERY DESCRIPTION.
BEST CAST STEEL WIRE, ADAPTED SPECIALLY FOR MECHANICAL PURPOSES;
Also for ROPES, NEEDLES, FISH HOOKS, PINS, CRINOLINE, &c.
BEST CAST STEEL FILES, SAWS, EDGE TOOLS,
HACKLES, GILLS, CARD CLOTHING, CARD TEETH, HACKLE AND GILL PINS,
FISH HOOKS, NEEDLES. &c.
ALSO
GENERAL MERCHANTS.

WM. JESSOP & SONS,
MANUFACTURERS OF
STEEL,
AND IMPORTERS OF IRON
SHEFFIELD, ENGLAND.
PRINCIPAL DEPOTS:
NEW YORK, Nos. 1 and 93 John Street.....BOSTON, No. 141 Federal.
ST. LOUIS, No. 714 North Second Street.
AGENCIES
PHILADELPHIA, Jas. C. Hand & Co.....PROVIDENCE, Nightingale & Kilton.
CHICAGO, Crerar, Adams & Co.....NEW ORLEANS, Folger & Co.
CINCINNATI, Augustus Wessel.....SAN FRANCISCO, Huntington, Hopkins & Co.

F. W. MOSS,
Successor to JOSHUA MOSS & GAMBLE BROS.
FRANKLIN WORKS, WADSLEY BRIDGE WORKS, WALKLEY WORKS, } SHEFFIELD, ENGLAND.
MANUFACTURER AND IMPORTER OF
STEEL AND FILES.
Principal Depots: 80 John St., N. Y., and 512 Commerce St., Phila.
MOSS & GAMBLE SUPERIOR C. S. "FULL WEIGHT" FILES,
Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.
WARRANTED CAST STEEL, especially adapted for DIES and TURNING TOOLS, DRILLS, COLD CHISELS, PUNCHES and all kinds of MACHINISTS' TOOLS.
Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools, warranted not to crack in hardening Taps of any size.
Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs.
English Spring and Plow Plate Steel. Also, manufacturer of
Best Cast Steel, Shear, German, Round Machinery, Hammer, Fork and Shovel Steel
And GENERAL MERCHANT.
A. M. F. WATSON, General Agent.

WILSON HAWKSWORTH, ELLISON & CO.,
MANUFACTURERS OF
STEEL, STEEL WIRE, &C.,
AND GENERAL MERCHANTS,
CARLISLE WORKS, SHEFFIELD, ENGLAND.
AGENCIES
New York, 72 John Street.
Philadelphia, 505 Commerce Street.
Boston, 21 Oliver Street.
New Orleans, La., 111 Gravier St.

Isaac Jenks & Sons,
MINERVA AND BEAVER WORKS, WOLVERHAMPTON, ENGLAND.
MANUFACTURERS OF
"JENKS" SPRING STEEL, "MINERVA" SWEDES, AND "ANGLO" CAST SPRING STEEL;
"JENKS" TIRE, TOE CORK, SLEIGH SHOE, BLISTER, AND PLOW STEEL;
ALSO,
"BEAVER" PLOW, TIRE, AXE, AND SHEET IRON.
VAN WART & McCOY, Agents, 134 & 136 Duane Street, N. Y.

J. & RILEY CARR,
MANUFACTURERS OF SUPERIOR
STEEL
For Iron, Cutlery, Saws, Files, Augers, Gimblets, &c.; Sheet Cast Steel for
SPRINGS AND STAMPING COLD;
ALSO THE CELEBRATED
DOG BRAND FILES,
Unsurpassed, if equaled in quality.
Bailey Lane Works, Sheffield, England.
Warehouse, 82 John St., New York.
Established 1810.

HENRY MOORE, Attorney.

Steel.

SANDERSON BROTHERS & COMPANY,
(LIMITED)
DARNALL WORKS, ATTERCLIFFE FORGE, } SHEFFIELD, ENGLAND.
Sole Manufacturers of the CELEBRATED
CAST STEEL,
Warranted most SUPERIOR and UNSURPASSED for
TOOLS and GRANITE ROCK DRILLS.
A full assortment of this universally approved OLD BRAND of English Steel, and
ARMITAGE'S GENUINE MOUSEHOLE ANVILS,
For Sale by
EDWARD FRITH, 16 Cliff Street, New York.

FRANCIS HOBSON & SON,
97 John Street, NEW YORK,
Sole Manufact'rs of "CHOICE" Extra Cast Steel.
Manufacturers of all Descriptions of Steel.
Manufacturers of Every Kind of Steel Wire.
Don Works, Sheffield, England.
JOHN HOGAN, Agent.

S. & C. WARDLOW,
MANUFACTURERS OF THE CELEBRATED
Cast and Double Shear STEEL,
In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table, Carving, Butcher and Shoe Knives, Turning Tools, Dies, Files, Clock or other Springs, Saws and Tools of every variety.
SHEFFIELD, ENGLAND.
Office of S. & C. WARDLOW, 95 John Street, New York.

In calling the attention of consumers of Steel in any of the parishes above enumerated, we would respectfully assure them of our ability to supply an article that cannot be excelled in quality, temper, and adaptation in all respects to the various purposes for which it may be required. Half a century of practical experience in all departments of Steel manufacture, a long established reputation in England, and the Continent of Europe, and in the Eastern States principally of this Country, encourage us to solicit a universal trial of our Steel for the above or other purposes for which a first class Material in quality, temper, and durability is needed

---

G. SANDERSON & CO.,
Manufacturers of all descriptions of
STEEL.
Bailey Street and Broad Lane Steel Works, } SHEFFIELD, ENGLAND.
Particular attention is paid to quality and temper for
Files, Saws, Table and Pocket Cutlery, Augers, Shovels, &c.
ALSO STEEL of superior quality for Turning Tools, Taps, Dies, Drills, &c.
Hot and Cold Rolled Sheets for Clock Springs, Corset Clasps, Pens, &c.
☞*Makers of the Celebrated ROCK BORING DRILL STEEL.*
Warehouse, 57 John Street, New York.

JOHN A. GRISWOLD & CO.,
Troy, N. Y.,
Office in New York City, 56 BROADWAY.
MANUFACTURERS OF
Bessemer Railway Steel,
MERCHANT BARS, TIRE AND SHAFTING,
Railroad Iron, Pig Iron, Merchant and Ship Iron,
AGENCIES IN BOSTON AND PHILADELPHIA.

D. G. GAUTIER & CO.,
MANUFACTURERS OF
Hammered and Rolled STEEL of every description
JERSEY CITY, NEW JERSEY.
DUDLEY G. GAUTIER. JOSIAH H. GAUTIER.

CHROME STEEL COMPANY,
MANUFACTURERS OF
CHROME CAST STEEL,
WARRANTED SUPERIOR TO ANY STEEL IN THE MARKET—EITHER ENGLISH OR AMERICAN—FOR EVERY PURPOSE.
Principal Office & Works, Kent Ave. and Keep St., Brooklyn, E. D., N. Y.
AGENCIES.
Kimbark Bros. & Co., Chicago, Ills.
Huntington, Hopkins & Co., San Francisco and Sacramento, Cal.
M. M. Buck & Co., St. Louis, Mo.
Potter & Hoffman, Philadelphia, Pa.
Geo. Dunbar & Co., Boston, Mass.
Wood & Leggat, Hamilton, Ont.

Steel.

Sheffield Steel Works,
(Established in 1848.)
SINGER, NIMICK & CO.
Pittsburgh, Pa.,
Manufacturers of Extra Quality Tool
CAST STEEL,
Patent Rolled
SAW PLATES,
All descriptions of Cast and German
Spring and Plow Steel
Elliptic and Side Springs, Seat Springs,
AXLES, STEEL TIRE,
Plow Wings, Shares, Cultivators,
Reaper Bars, ow Bars, &c., &c.
Warehouse, 83 Water and 100 First Streets

MILLER, BARR & PARKIN,
Crescent Steel Works,
PITTSBURGH, PA.
Manufacturers of all descrip[illegible] of
STEEL
EQUAL TO ANY IN THE MARKET.
Office.....339 Liberty St.
PITTSBURGH, PA.

Gunpowder.

GUNPOWDER
DUPONT'S
Sporting, Shipping, and Mining
POWDER.

DUPONT'S GUNPOWDER MILLS
ESTABLISHED IN 1801,
Have maintained their great reputation years. Manufacture the
Celebrated Eagle Ducking, Eagle Rifle, and Diamond Grain Powder.
Also, SPORTING, MINING, SHIPPING, AND BLASTING POWDER.
of all kinds and descriptions.
For sale in all parts of the country. Represented by
F. L. KNEELAND
70 Wall Street, NEW YORK.

GUN-POWDER
LAFLIN & RAND POWDER CO.
21 Park Row, New York,
invite the attention of the the Hardware Trade to their facilities for delivering
BLASTING, MINING and RIFLE
POWDER
IN EVERY PART OF THE UNITED STATES
from having agencies and magazines at all prominent points, beside our works at
Newburg, Saugerties, Kingston, and Catskill, N. Y.; Scranton, Carbondale and Pottsville, Pa.; Baltimore, Md., and Platteville, Wis.
The superiority is well known of our brands Rifle Powder
Orange Rifle, Orange Ducking
Lightning, Audubon.
SAFETY-FUSE at wholesale.

BARR'S ELLIPTIC
Steam Trap

THE BEST IN THE WORLD
SEND FOR A CIRCULAR.
Richards & Pike.
5th St., below Columbia Ave., Philadelphia.

GRAHAM BROS.,
London and Stockholm,
Engineers, Anglo-Swedish Merchants
And Engineers' Agents.
First-class Makers of Machinery & Specialties, &c., desirous of extending their exports, will find it in their interest to supply us with full particulars and prices, &c., &c.
London—122 Cannon Street, E.C.

Steel.

HUSSEY, WELLS & CO.

MANUFACTURERS OF ALL DESCRIPTIONS OF

CAST STEEL,

INCLUDING

Best Refined Steel for Edge Tools.

PARTICULAR ATTENTION PAID TO THE MANUFACTURE OF STEEL FOR

Railroad Supplies, Homogeneous Plates

FOR LOCOMOTIVES, BOILERS AND FIRE BOXES,

Smoke-Stack Steel, Cast Steel Forgings for Crank Pins, Car Axles, &c.

ALSO, MANUFACTURERS OF THE CELEBRATED BRAND

"Hussey, Wells & Co. Cast Spring Steel,"

For Elliptic Springs for Railroad Cars & Locomotives.

PENN AND SEVENTEENTH STS., PITTSBURGH, PA.

BRANCH OFFICES:

30 Gold St., New York. 13 & 15 Custom House St., Boston. 146 E. Lake St., Chicago.

Pittsburgh Steel Works.

ESTABLISHED IN 1845.

ANDERSON & WOODS,

MANUFACTURERS OF

BEST REFINED CAST STEEL,

Cast and German Plow and Spring Steel,

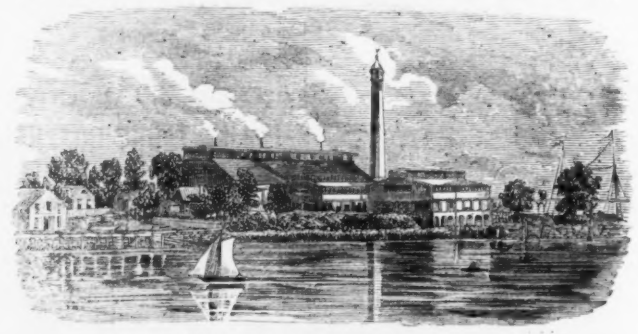
FIRST AVE., AND ROSS ST., PITTSBURGH.

BRANCH HOUSES

LOTHROP & CO., 16 Hamilton St., Boston. A. B. PARKER, 12 Cliff Street, New York.
W. F. POTTS, SON & CO., 1225 Market Street, Philadelphia.

FARIST & WINDSOR,

BRIDGEPORT, CT., 1872.



WINDSOR LOCKS, CT., 1860.

ALL DESCRIPTIONS OF

CAST STEEL

made to order for **Cutlery, Dies, Agricultural Implements, Decarbonized Steel, Frog Plates and Points, Steel Forgings to Pattern.** Quality equal to the best. Prices as low as the market admits.

JOEL FARIST. **JOHN B. WINDSOR.**

LABELLE STEEL WORKS.

SMITH, SUTTON & CO.,

MANUFACTURERS OF ALL KINDS OF

STEEL.

Also, Springs, Axles Rake Teeth, &c.

OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny.

Post Office Address, Pittsburgh, Pa,

STURTEVANT

Pressure Blowers, Fan Blowers and Exhaust Fans.

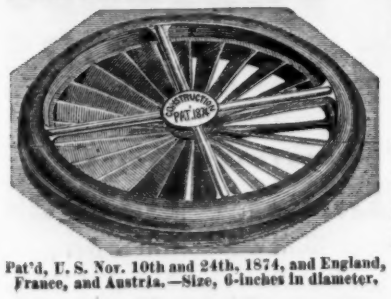
10,000 SOLD IN SIX YEARS.

SEND FOR ILLUSTRATED CATALOGUE.

B. F. STURTEVANT, 72 Sudbury Street,

BOSTON, MASS.

CONSTANT VENTILATOR,



Only One that Propels & Distributes Pure Air without Draft.

Thousands in use in Principal Hotels, Banks, Newspapers, Schools, &c. No place too large to Ventilate. Samples (Nickel and Gilt) sent by mail on receipt retail price, $2·50, inclosing instructions of a new and ready method for inserting in glass in a few minutes. The difference between retail and trade price for sample will be allowed on next order.

Pat'd, U. S. Nov. 10th and 24th, 1874, and England, France, and Austria.—Size, 6-inches in diameter.

T. W. BRACHER, 77 Creene St., N. Y.

BUFFALO
Bellows Factory and Planing Mill.

ESTABLISHED 1852.

JOSEPH CHURCHYARD,
Contractor, Builder
AND
Manufacturer,

CLINTON, cor. ADAMS STS.,

Buffalo, N. Y.

SASH, BLINDS, DOORS,

Cisterns, Tanks, Stairs, Hand Rails, Newels, Mirror Frames, Mantels, Curtain Cornices, Book Cases, Veneered Doors, Mouldings, and complete interior and exterior finish for houses.

ROUGH AND PLANED LUMBER,

Flooring, Siding, Shingles, Lath and Fence Posts.

Blacksmiths' & Moulders' Bellows.

TACKLE BLOCKS

BURR & CO

Manufacturers of Waterman and Russell

PATENT IRON STRAPPED BLOCKS

ALSO, MANUFACTURERS OF

ROPE STRAPPED BLOCKS,

31 PECK SLIP, NEW YORK

TUCKER & DORSEY,

MANUFACTURERS,

Indianapolis, Ind.

BOSTON.

(Reported by Macomber, Bigelow & Dowse, 156 to 164 Oliver St.)

Augers.—Watrous Ship.....dis 10 %
L'Hommedieu Ship.....dis 15 %
Axes.—Forester's Favorite, Bronzed.....$12 00
Blue Jackets, Blue.....11 5
Excelsior, Black.....11 00
Chopper's Pride, Bronzed.....10 50
Red Cross, Red.....10 00
Red Cross, Handled.....12 50
Boy's Handled Blue Jackets.....12 00
Axe Handles.—Wadleigh's Oak—
A (Extra) $2·50. B (No. 1) $2·00. C (No. 2) $1·50 ₰ doz
Bells, Sleigh—
Fancy Body, Patent Leather, Cloth Bound, White Metal, 30, No. 1.....$1·70
Fancy Body, Patent Leather, Cloth Bound, White Metal, 36, No. 1.....1·80
Fancy Body, Patent Leather, Leather Bound, Extra Tinned, 30, No. 1.....·88
Fancy Body, Patent Leather, Leather Bound, Extra Tinned, 36, No. 1.....2·50
Fancy Body, Patent Leather, Leather Bound, Silver Plated, 30, No. 1.....3·38
Fancy Body, Patent Leather, Leather Bound, Silver Plated, 36, No. 1.....3·50
Shaft, Strap, White Metal, House Bells, extra, 6, No. 1.....per pair, 50c.
Common, 6, No. 1.....45c.
Blind Hinges.—
Off or Washburn's.....per hundred sets $9 50
Blind Fasts.—
Off or Washburn's.....per hundred set $6 00
Bolts.—Carriage, Phila., "Girard Works.....dis 50&10 %
Borax.—Best Refined.....₰ lb 15c
Borers.—Angle, Backus'.....dis 50 %
Boring Machines.—Angle.....each $4 75
Common, Snell's quality.....each 3 75
Braces.—Barber's.....dis 40&5 %
Backus'.....dis 50 %
Spofford's.....dis 50 %
Amiuon.....dis 50 %
Brackets.—Star Bronzed.....dis 50&10 %
Star Japanned.....dis 60&10 %
Ice Shelf.....dis 35 %
Brass Faucets.—L. F. & C.....dis 25 %
Butts.—Union Drilled Loose Joint.....dis 45&10 %
" " Wire Fast Joint.....dis 25&10 %
" " Acorn Loose Joint.....dis 40&10 %
Brass Butts.....dis 30 %
Wrought Table Butts and Back Flaps.....dis 30 %
Wrought Narrow Butts.....dis 30 %
Can Openers—Sprague's.....dis 50 %
No. 1, Iron Handle.....$4·00
No. 2, Wood Handle.....4·50
Cartridges.—"U. S. Cartridge Co."....dis 50&10 %
Chisels.—"Buck Bros.' Star" Goods....add 20 @ 22½ %
Sockets.....add 22½ @ 25 %
Churns.—Lightning—

	3	4	5	6 gall
Redheffer patent..... per doz	$22 00	$27 00	$31 50	$36 00

Coal Hods......dis 35 %
Fancy Japanned, No. 4, 15 in., $8·00; 5, 16 in., $9·00; 6, 17 in., $10·00.
Fancy Galvanized, No. 4, 15 in., $11·50; 5, 16 in., $13·00; 6, 17 in., $14·00.
Perfection, Jap'd, No. 4, 15 in., $12·00; 5, 16 in., $13·00; 6, 17 in., $14·00.
Perfection, Galv'd, No. 4, 15 in., $15·00; 5, 16 in., $16·00; 6, 17 in., $17·00.
Morning Glory, Jap'd, No. 4, 15 in., $12·00; 5, 16 in., $13·00; 6, 17 in., $14·00.
Morning Glory, Galv'd, No. 4, 15 in., $15·00; No. 5, 16 in., $16·00; No. 6, 17 in., $17·00.
Compasses and Dividers.—Bemis'.....dis 35 %
P. S. & W.....dis 25 %
Cordage.—Manilla (usual trade dis.).....₰ lb, 15c
American Tarred Hemp Lath Yarn.....₰ lb, 10c
Corn Hooks.....per doz $2·75
Cow Ties.....dis 10 %
No. 30, Open Ring, 3 foot, No. 6, with Toggle.....$3·70
No. 35, " 3 " No. 6, " Snap.....3·90
No. 40, " 3½ " No. 5, " Toggle.....4·25
No. 45, " 3½ " No. 5, " Snap.....4·40
No. 50, " 4 " No. 4, " Toggle.....4·85
No. 55, " 4 " No. 6, " Snap.....5·00
No. 60, " 4½ " No. 3, " Toggle.....5·60
No. 65, " 4½ " No. 3, " Snap.....5·80
Crow Bars.—Iron. Steel Points.....₰ lb, 5½c
"Sweet" Steel Bars.....₰ lb 11c
Brown's Steel Bars.....₰ lb 10c
K. P. & Co. Extra Drill Steel.....₰ lb 15c
Dividers.—Cook's Nickel Plated.....dis 15 %
Door Springs.—Stimson's Patent.—
No. 1, Light inside doors, $12·00.....dis 25 %
No. 2, " outside " $18·00.....dis 25 %
Torrey's.....$4·00
Egg Beaters.—Lightning, Redheffer pat., 1 qt., 2 qts. per doz $8 00 $12 00
Emery.—Alden.....₰ lb 6½c
Wellington Mills.....₰ lb 10c
Files.—Earl Smith & Co.'s English.....$5 to £ gold
American.....$5 to £ currency, less 12½ %
Nicholson.....new net list
Wheeler, Madden & Clemson.....£5 net
Stubb's Tapers, grenuine, 3 in., $1·50; 3½, $1·62½, 4, $1·88; 4½, $2·13; 5, $2·50.
Funnel Irons.—$2·50 2·50 2·50 3·25 per doz
5, 5½, 6, 7 inch.
Deep Flange.—$3·50 3·75 4·00
5, 5½, 6 inch.
Hammers.—Maydole.....dis 5 %
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, $9·75
" " " " bell face, No. 1, $11; 1½, $9·75.
Hangers & Rollers.—Novelty.....dis 30 %
Anti-Friction.....$1 75 per pair—dis 30 %
Hatchets.—Underhill Edge Tool Co.....dis 15 %
C. F. Downe, warranted Cast Steel—
Shingling.....0, $4·75; 1, $5·25; 2, $5·75
Claw.....1, 5·75; 2, 6·25
Lathing.....1, $5·50
Axe Pattern.....1, $7·00; 2, 7·50
Broad.....0, $5·25; 1, $6·50; 2, $7·50; 3, $9·25; 4, $10·75; 5, $12·75; 6 $14·75.

Hinges.—Strap and T, Stanley Works.....dis 35&10 %
Plate, Loose and Fast Joint.....₰ lb 6c
Wrought Screw Hook.....₰ lb 6½c
Knobs.—Young's Imp. Silvered Glass.....dis 15 %
Lanterns.—Tubular No. 0.....$9·50
Guarded, No. 74, (with kerosene oil and candle burners).....6·25
Lead.—Sheet and Pipe.....9c—less 10 %
Locks.—Norwalk Lock Co.....dis 45&5 %
Mattocks.—
K. P. & Co., axe finish, long cutter.....$13 00—dis 10 %
Short cutter.....12 75—dis 10 %
Meat Cutters.—"Miles's" Challenge.....dis. 20 %
No. 1, $22·00; 2, $20·00; 3, $40·00.
Metal.—Babbitt, No. 1, 35c; 2, 25c; 3, 16c; 4, 15c ₰ lb
Nails.—10d and larger—dis 15c 100 keg lots.....$3 50
Nail Pullers.—Little Giant—Small.....per doz., $22·00
Little Giant—Large....." 30·00
Padlocks.—Wilcox.....dis 45c 5 %
All Brass, 2½ inch, 2 keys, job lot.....$9 00
Paper.—Tar'd Sheathing.....₰ lb 2 c
Dry Sheathing....." 3½c
" "Beaver Brand" Rosin Sized....." 4½c
Tar'd " " " " 3½c
Felt " " " " 4½c
Picks.—
K. P. & Co. Axe Finish..₰ doz 5 to 6 $8·50; 6 to 7 $9·00
" " Solid Eyes.....5 to 6 6 to 7
$9 00 $9 50
Pins.—Universal Hat and Coat and wood—
2 in.....₰ gross $2 50; 3 in., 3 5/8; 4 in., 4 50—dis 15 %
Potato Digger.—
"Partridge," 6 square tine.....₰ doz $12 00
Shumway & Co., 6 round tine.....₰ doz 9 00
Pulleys.—Axle.....1¼ No. 15, 30c; 1¼ No. 18, 33c; 1¼ No. 28, 42c; 2 No. 29, 49c.
Nashua, Bronzed Face.....1¼, 30c; 2, 9c
Steel Axle " " .....2, $1·00
Pulley Blocks.—"Best Boston Make".....net
Common Strapped Blocks—

4	5	6	7 inch.
Single, 75c.	85c.	$1·00	$1·13 each.
Double, $1·00	1·12	1·25	1·40 "

Inside Iron Strapped Blocks—

5	6	7	8	9	10 inch.
Single, $1·00	1·13	1·38	2·00	2·25	1·75 each.
Double, 1·88	2·30	2·63	3·63	4·00	5·00 "

Inside Iron Strapped Blocks, with Patent Roller Bushings—

5	6	7	8	9	10 inch.
Single, $1·25	1·50	1·65	2·50	2·65	3·50 each.
Double, 2·50	2·60	3·38	4·63	5·00	6·50 "

Plated Ware.—Rogers bros.....dis 50 %
Plumb & Levels.—"Davis" Pat. Adjustable—
No. 1, Iron and Wood Center Levels.....dis 50 %
No. 2, First Quality Levels.....dis 60&10 %
No. 3, Iron Pocket " .....dis 35 %
No. 4, Level and Plumb Glasses.....dis 60&10 %
No. 5, Iron Pocket Levels, per square and straight edge.....dis 50&10 %
No. 6, Improved Iron Bench Planes.....dis 20&10 %
Pocket Knives.—Comb. Cutlery Co.....new net list
American Shear Co.....dis 33⅓ %
Rail Barn Door.—For Novelty and Anti-Friction Hangers.....per foot 7c.. dis 30 %
Rivets.—Black.....dis 25 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8,
13 13 14 14 15 16c ₰ lb net
Rubber Moldings.—"Harmon's".....dis 10 %
No. 2, for Windows.....per foot, 5c
No. 3, for Doors.....per foot, 10c
No. 4, " .....per foot, 12c
Sad Irons.—Bliss & Drake.....₰ lb 3½
Sand Paper—0 to 2, $4·25; 2 to 3, $4·75.....dis 10 %
Saws.—*Hand and Panel—*
Wheeler, Madden & Clemson's, same list as "Disston's".....dis. 15 %
Disston's.....dis. 12½ %
Cross Cut—
Wheeler, Madden & Clemson X Cuts.....per ft., 37c
" " " "Star" X Cuts. " 60c
" " " Champion X Cut. " 50c
" " " One Man X Cut..each, $2·25
Boynton's genuine Lightning X Cut.....per ft., 60c
" " " One Man X Cut..each, $2·25
Circular—Wheeler, Madden & Clemson's.....dis. 25 %
Mill— " " " .....dis. 25 %
Screws.—American Screw Co.....revised list dis 62½ %
Aiken's.....dis 60&10 %
Scythe Stones.—
"Willoughby Lake," first quality.....₰ gross $6·50
" second quality..... 3·00
Shovels.—O. Ames.....new list dis 12½ %
M. B. & D.....new list dis 12½ %
Snow, Malleable Iron Tip, D Handle—Agents for New England.....$6·50
Snow, Malleable Iron Tip, long Handle—Agents for New England.....5·50
Sifter.—Coal, Rice, &c.....$12 00
Spading Forks.—M. & F.....dis 25 %
Stone Pickers.—"Partridge," original..₰ doz $15 00
Tools.—Aiken's Pattern, 20 in set; Parr's, $8·00 per doz
Traps.—Oneida.....dis 20 %
Blake's.....dis 40 %
Vises.—K. P. & Co.'s Solid Box Blacksmith.....₰ lb 12c
Parker's Parallel.....dis 10 %
Backus.....dis 25 %
"Howards." Parallel.....dis 20 %
Wardrobe Hooks.—Wire to drive.....₰ gross $1 00
Weather Strips.—"Harmon's".....per doz 85, dis 10 %
Weights.—Window Weights.....₰ lb 2c
Wedges—Axe.....₰ doz 38c
Wire.—
Eureka, in spools, No. 28 to 10 assorted...₰ gross $3 50
Wire Netting.—Clinton Wire Cloth Co., Green, Drab or Black.....₰ ft 5½c
Wrenches.—Genuine Wrenches, G. A. Coes..dis 40&10 %
Walton.....dis 50 %
Wringers.—

Novelty and Universal	Tub No. 2	Less than 2 doz, $61 00
		2 doz or more, 62 00

Bench A... less than 2 doz $82 00; 2 doz or more $80 00
" B... " " 90 00 " " 88 00
" C... " " 108 00 " " 105 00
Eureka.....per doz $58 00
Withington, Cooley & Co.—
Hoes, Rakes, Forks, &c.....dis 33⅓ %

Boston Metal Market.

(Corrected by Fuller, Dana & Fitz, 110 North Street, Boston, Importers and Commission Merchants.)

Iron.—Best Refined Bar Iron.....₰ ton $60 00 @ 62 50
"Burden Best" " " " 100 00
Swedish Bar Iron.....gold " 110 00
Norway Shapes.....gold " 125 00
Norway Nail Rods.....gold " 130 00
Sheet Iron, American, No. 2 extra, ₰ lb 4½c
" " Galvanized, No. 2 extra, " 9 c
" " Russian, No. 2 ex., gold " 14 c
Plate Iron, C. No. 1..... " 3½c
Iron Rails.....₰ ton $52 00
Steel Rails..... " 47 50
Pig Iron, Foundry, No. 1 extra.... " 29 00
" " No. 2 extra.... " 27 00
" Gray Forge.... " 25 00
" Scotch..... 30 00 @ 32 00
Wrought Scrap Iron..... " 31 00
Old Rails..... " 24 00
Steel.—₰ lb.
Eng. Tool, gold 15½c
American Tool 14 c
" Mach 9½c
Passenger 7 c
Tin Plate.—₰ box gold
I. C., Char. 10x14 @ $6·75
I. C., Coke 10x14 7 50 @ 8 00
Char Roof, IC, 14x20, 8 00
Coke " IC, 14x20, 7 00
METALS.
Pig Tin.—₰ lb., gold
Banca 24c
Straits. 24c
English..... 23c
German ₰ lb
Spring.....
Tire.....
Sleigh Shoe..... 5 c
Toe Calk..... 7½c
Copper.—₰ lb.
Ingot..... 23½c
Bolt..... 30c
Sheathing..... 28 c
Lead.—₰ lb
Pig..... 7½c
Sheet & Pipe..... 8·55
Zinc.—Sheet..₰ lb 10c
Spelter......₰ lb 7½c
Antimony. gold ₰ lb 12½c

ST. LOUIS.

Corrected weekly by Semple, Birge & Co.

Apple Parers.—Conqueror.....₰ doz., $1 7
Hudson's Rotary..... " 7 75
Axes.—Wm. Mann's, Red Warrior.....₰ doz. $11 50
Wm. Mann's, W. Stewart's..... " 13 00
" C Marshall..... " 10 50
" Handled..... " 13 c extra
" Double Bitted..... " 2, 5
H. L. B. & Co., L. & Co..... " 11 50
" Pioneer..... " 12 00
" James & Co..... " 11 00
Hunt's..... " 12 00
Axles.—"Jones, Henry & Co.'s" Patent Lubricating, Half Patent, Swelled Taper, Plain Taper and Concord Axles.....dis 10 & 5 %
Common Axles (Pat. Lubricating), 1½ inch and upward.....₰ lb. 6½c.
do less than 1½ inch..... " 7 c.
Bellows.—dos. St. Louis make, 60c ₰ in. dis 20&2½ %
Bells.—Troy, Church, School and Farm Bells..₰ lb 40
"Improved Amalgam Bronzed," 15 in ₰3·00; 17 in., $4·00; 19 in., $6·00.....dis 10 %
Belting.—"Boston Belting Co.'s Rubber..dis 30 & 7½ %
"Bradford & Sharp's" Oak-Tanned Leather....dis 30 %
Bolts.—Arms, Bell & Co.'s Carriage & Tire..dis 70&10 %
Arms, Bell & Co.'s Machine.....dis 30&10 %
Butts.—Western Butt Co.'s new list—
Narrow Fast Joint.....dis 25&10 %
Broad Fast Joint.....dis 30 & 10 %
" Loose " .....dis 45&10 %
Reversible.....dis 40&10 %
" Japanned and Silver Tipped.....dis 40&10 %
Loose Joint "Acorn" " " .....dis 40&10 %
Wheeling Hinge Co.'s W't Fast Joint Narrow.....dis 30 %
" " " Broad.....dis 35 %
" " Loose Joint.....dis 30 %
" " Reversible.....dis 35 %
" " Table & 1¼ Flaps.....30 %
Churns.—Julian, No. 2, $7·00; No. 3, $7·50; No. 4, $8·50.....dis 20 %
Cider Mills.
American Senior, $40·00; Am. Junior, $25·00....dis 15 %
Corn Knives.—Dunn Edge Tool Co.'s Clip.....5 75
Seymour Mfg. Co.'s Solid Steel Back.....5 00
Corn Shellers.—Sandwich Mfg. Co.'s—
Power Shellers.....dis 10 %
Hand Shellers.....special rates
Corn Planters.—Challenge, Horse.....$49·00 net
St. Louis, Hand.....per doz $15·00
Cotton Gins.—Dubois Patent.....dis 10 %
Crow Bars.—Steel Pointed.....₰ lb 6½c
Drag Saw Machines.—
Culver's Iron Drag Saw.....dis 10 %
Robinson's Patent Sweepstakes Drag Saw....dis 10 %
Fanning Mills.—Nash & Cutt's.....dis 15 %
Feed Cutters.—Improved Eurdick National...dis 15 %
Sanford No. 1, $12·00; No. 2, $8·75.....net
Files.—Black Diamond, Mill.....$5·00 £ currency.
" Bastard..... 5·00 £ currency.
" Taper..... 5·00 £ currency.
Forges.—Keystone Portable Forge Co.'s.....dis 12½ %
Forks and Hoes.—
Auburn Mfg. Co.'s Hay and Manure Forks....dis 33⅓ %
" Handled Hoes.....dis 33⅓ %
Garden Seed Drills and Wheel Hoes.
Allen's Double Wheel Hoe.....dis
" Planet Drill, Nos. 2 and 3.....dis
" Combined Drill and Wheel Hoe.....dis
Grinding Mills.—French Burr Mills.....net
Challenge Feed Mills.....dis
Sedgeberr's Nonpareil Mills.....dis
Osage Corn and Cob Mill.....dis
Hammers.—Masons' Hammers.....₰ lb 20c
Smiths' Hand..... " 30c
Handles.—No. 1 Fork, Hoe and Rake.....dis 20 %
No. 2 Fork, Hoe and Rake.....dis 40 %
Harrow Teeth.—4 inch iron.....₰ lb 4½c
⅞ and ⅞ inch iron..... " 4½c
Barbed or Headed.....3c extra
Hay and Cotton Presses.—
Dederick's Railroad.....dis 5 %
" Perpetual.....net
Hay Knives.—
Dunn Edge Tool Co.'s.....₰ doz $15 00—dis 15&5 %
Lightning (Weymouth's Patent).....₰ doz $20 00
Hinges.—
Wheeling Hinge Co.'s Strap & T.....dis 33⅓&10 %
Horse Hay Forks.—Nellis' Harpoon.....dis 45 %
Horse Nails.—National Patent Pointed.....2 3c rates
National Patent Pointed, extra finished.....4 3c "
Horse Powers.—Pitts or Carey's Patent.....dis 10 %
Wheeler's Railway.....dis 10 %
Sandwich Lever.....dis 10 %
Horse Rasps.—Heller Bros.....dis 45 %
"Black Diamond".....$6 00 to the £ currency
Horse Shoes.—
Rhode Island (Perkin's Pattern).....₰ keg, $6 25
" Mule..... " 7 25
" Trotting Shoes..... " 8 75
Tredegar Horse.....per keg $6 25
" Mule.....per keg 7·25
Hose.—
Boston Belting Co.'s Rubber Medium Sizes..dis 30&10 %
" " " Small sizes, Hydrant.....dis 40 %
Ice Tools.—W. T. Wood & Co.'s Saws.....new list net
W. T. Wood & Co.'s Chest Hatchets.....new list net
" " Axes.....new list net
" " Loading Tongs.....new list net
" " Medium, Small and Family Tongs.....new list net
" " Chisels, Hooks and Grapples.....new list net
Lawn Mowers.—Archimedean.....dis 30&5 %
Charter Oak.....dis 30 %
Mattocks and Grub Hoes.—
Klein, Logan & Co.'s Mattocks..₰ doz $13 00 @ 13 5
Grub Hoes, oval eye..... " 10 00 @ 11 50
Money Drawers.—
Pierpont & Co.'s Excelsior.....per doz $40·00 net
Nails.—Wheeling.....$3 45 rates
Packing.—Boston Belting Co.'s Rubber, Plain...dis 30 %
Boston Belting Co.'s Rubber, Pure.....dis 25&5 %
" " No. 2 Plain.....dis 40 %
" " Round and Square....dis 10&10 %
Picks.—Klein, Logan & Co.'s Railroad and Clay.....₰ doz $9 30 @ 11 00
Klein, Logan & Co.'s Coal..... " 7 45 @ 8 40
" " Pon..... " 12 60 @ 13 20
" " Stone..... " 14 40 @ 14 90
" " Tamping..... " 14 75 @ 15 35
" " Miners' Drifting..... " 10 25 @ 12 80
Plows.—Avery's Cast and Steel.....dis 15 %
Collins Cast Cast Steel.....new list net
Pekin Steel.....new list net
Post Hole Augers.—Clark's Patent—
No. 1, ₰ doz. $27; No. 2, $30; No. 3, $32.....dis 20 %
Pulleys.—5 inch.....per doz $4·25 net
4 inch.....per doz 3·25 net
Nellis' Patent.....new list dis 15 %
Pumps.
St. Louis, Farm, Patent Metal Lined...new list dis 50 %
Rakes.—Paddock's Premium Sulky.....$30 00 net
St. Louis Revolving 14 tooth..... 5 50 net
" 16 " 6 00 net
" Hand Hay Rake.....dis 10 %
Reaper Knives and Sections.—
Geo. Barnes & Co.'s Knives.....dis 40 %
" " Sections.....dis 40 %
Road Scrapers.—Steel.....dis 25 %
Cast Iron.....dis 10&2½ %
Sad Irons.—Monitor Brand, Silver Polished...₰ lb 4c
Sash Weights.—Standard Solid Eyes.....₰ lb 3½ c
Saws.—Curtis & Co.....dis 10 %
Scythes.—Dunn Edge Tool Co.'s.....new list dis 20&5 %
Scythe Stones.—No. 1 Ind'a Pond (gr's, $7 00
Extra Indian Pond, " 7 50
Premium " 10 50 dis 25
Diamond Grit. " 13 00
Shovels and Spades.—Myers & Armor.....dis 15 %
O. Ames & Son.....dis 5 %
Grain Scoops, (Pat. Corrugated Straps) M. & A. dis 15 %
" " T. Rowland's dis 15 %
" " O. Ames & Son dis 5 %
Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished.....₰ lb 15c
Solid Cast Steel..... " 35c
Spaths and Cradles.—Seymour Mfg. Co.'s...dis 20 %
Sorghum Machinery.—Bell Cane Mills.....dis 15 %
Scantlin's Seamless Evaporators.....dis 10 %
Springs.—Cleveland Spring Co. s—
Carriage and Express.....dis 12½ %
Blue Seat Springs.....dis 15 %
Vises.—Solid Box.....₰ lb 16c
Wilson Mfg. Co.'s.....dis 15 %
Wheelbarrows.—Railroad & Garden.....new list net
Wrenches.—Coes' Genuine.....dis 23½&4
Coes' Pattern.....dis 50 %
Wagons.—Whitewater Farm Wagons—
Thimble Skein.....No. 3, 3½; $80 3½, $81
Iron Axle.....No. 1½, $90; 1¾, $93 1¼, $95

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellew & Co.)

Tin Plate.

IC, 10x14, Char	11 00	IX, continuous, 20 in. x 200 lb	
IX, 10x14, "	13 50	IC, 10x14, best	
IC, 12x12, "	11 50	Coke	$10 00
IX, 12x12, "	14 00	IC, 10x14, good	
IC, 14x20, "	12 00	Coke	9 50
IX, 14x20, "	14 50	IC, 10x30	16 00
IC, 14x20, Terne	10 50	IX, 14x30	19 00
IX, 14x20, "	18 00	IC, 11x24, Coke Lead	9 50
IC, 20x28, "	22 00	IX, 10x14, punch'd for Safes	3 50
IX 20x28, "	27 00		
IC, continuous 20 in. x 200 ft			

Block Tin.

Large Pigs	27c	Bars	27c
Small "	27c		

Sheet Zinc.

Casks	₰ lb 10c	Sheet	₰ lb 10½c

Solder.

No. 1, Refined, in bars or plate			16c
No. 2, " " "			15c
Pig Lead			7c

Sheet Copper.—18 to 100 lbs. Sheets 30x60.....31c
14 to 16 lbs., Sheets 30x60.....31c
10 to 12 lbs., " " and 30x32.....33c
6 to 9 lbs., " " 35c
Tinned, 14 and 16 oz. 14x48.....33c
Planished, 14 and 16 oz. 14x48.....38c
No. 7 and 8.....40c
Copper Bottoms.....33c

Sheet Iron.

	Common.	Smooth, Com.	Smooth Charcoal.	Smooth Juniata.
No. 24	4½c	5 c	5½c	8¾c
25 & 26	4½c	5¾c	7 c	9 c
27	4¾c	6 c	7¾c	9¾ c

Galvanized Iron.....dis 25 %

No. 16 to 20	12c	No. 24	15c
21 to 24	13c	28	16c
25 & 26	14c		

Russia Iron.—Perfect.....15c | No. 1 Stamped..... In Sheets, 1c. higher.
American Russia.—A.....14c | Best.....11c In sheets, 1c higher.
Lead.—Pig.....7½c | Lead Pipe, in full coils .8¼c
Bar.....8¼c | Lead Pipe, when cut. .8¾c
Sheet Lead.....8¾c
Wire—Bright.....dis 35 %
Coppered.....dis 30 %

CHICAGO.

(Reported by Frank Sturges & Co., 72, 74 & 76 Lake St.)

Tin Plate.—

10x14, IC, Ch'l, Good	$8	14x20, IX, Ch'l Best	$15 00
10x14, IC, " Best	11 50	14x20, IXX, " "	17 50
10x14, IX, " "	13 00	14x20, IXXX, " "	20 00
12x12, IC, " "	12 00	DC, 100 Plate, " "	11 50
12x12, IX, " "	14 50	DX, " "	14 00
14x20, IC, " "	12 50	DXX, " "	16 50
14x20, IX, " "	14 50	DXXX, " "	19 00
Roofing IC, Charcoal, Best			11 00
Roofing IX, Charcoal "			13 50
20x28, IC, Charcoal Roofing, Com			20 00
20x28, IC, " Fair			21 50
20x28, IC, " Best			23 00
20x28, IX, " "			26 50
10x14, IC, Coke Plates			10 00 @ 10 50
14x20, IC, "			10 50 @ 11 00
10x20, IC, "			16 50

Block Tin.

Large Pigs	26c	Bars	28c
Small "	27c	Strait's 2c higher.	

Zinc.—Sheet, 500 to 1000 lb. Casks.....10½c
Loose Sheets.....11c
Slab Zinc or Spelter.....7¼ to 8c
Copper.—Bottoms.....34c
Sheathing.....3 c
Planished.....39c
" Boiler lengtos.....41c
Ingot.....24c to 25c
Bolt.....35c
Braziers' Sheets.—
30x60, 6 to 8 lbs., ₰ lb 35c | 30x60, 15 to 100 lbs., ₰ lb 31c
30x60, 10 & 12 lbs., " 33c
Solder.—F. S. & Co.'s make.
Best Fine.....30c
No. 1.....28c
Roofing.....17c
Braziers' or Spelter Solder.....32c to 35c
Antimony.....14c
Babbit Metal—F. S. & Co.'s.....16c
No. 2.....14c
Sheet Iron.—

	Common.	Smooth, Com.	Smooth Charcoal.	Smooth Juniata.
No. 24	4½c	5 c	5½c	8¾c
25 & 26	4½c	5¾c	7 c	9 c
27	4¾c	6 c	7¾c	9¾ c

Galvanized Iron.....dis 25 %

No. 16 to 20	12c	No. 24	15c
21 to 24	13c	28	16c
25 & 26	14c		

Russia Iron.—Perfect.....15c | No. 1 Stamped..... In Sheets, 1c. higher.
American Russia.—A.....11c | Best.....11c In sheets, 1c higher.
Lead.—Pig.....7½c | Lead Pipe, in full coils .8¼c
Bar.....8¼c | Lead Pipe, when cut. .8¾c
Sheet Lead.....8¾c
Wire—Bright.....dis 35 %
Coppered.....dis 30 %

TO ALL WHO USE STEAM-POWER!

We will put our Governor on any Engine, and guarantee it to prove itself superior to all others.

If, after a fair trial, it does not, we will take it off at our own expense.

Shive Governor Co

BETHLEHEM, PA.

ALSO,

SHIVE'S PATENT WATCHMAN'S CLOCK AND DETECTOR.

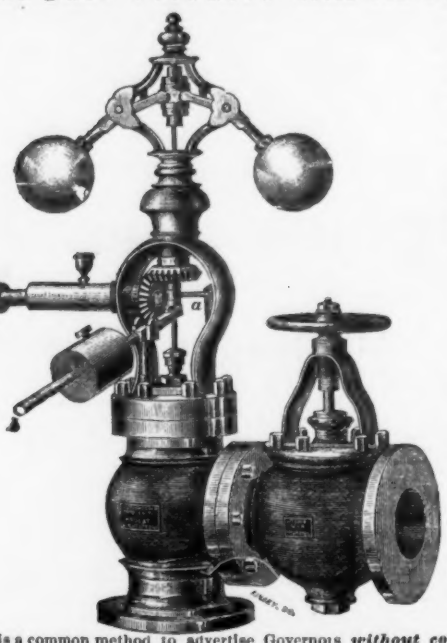
The Best and Cheapest Watcher of the Watchman made

PRICE ONLY $15.

Circulars sent free

February 10, 1875. REDUCED PRICE LIST OF THE

JUDSON PATENT IMPROVED GOVERNORS.



☞ When Governors are ordered, be particular and say Governor with Stop Valve, or without Stop Valve; and either Black, Finished or Portable, as you may require, and with or without Lever Attachment.

For dimensions and other particulars send for Illustrated List.

Capacity of Valve or Diameter of Steam Pipe in Inches.	Price, Black.	Price, Bright Finish.	Price, Portable.	Price of Lever Attachment for altering speed.	Price of Stop Valve.
½	18·00	20·00	17·00	..	..
⅝	20·00	22·00	19·00	..	..
1	24·00	27·00	22·00	2·00	5·25
1¼	29·00	32·00	27·00	2·25	6·60
1⅜	34·00	38·00	31·00	2·50	8·50
2	41·00	46·00	38·00	2·75	11·50
2¼	47·00	54·00	..	3·25	16·00
2½	50·00	57·00	47·00	3·50	17·00
2¾	55·00	62·00		3·75	19·00
3	62·00	70·00	No Larger Portable made than 2½ in.	4·25	22·00
3⅜	71·00	80·00		4·50	27·00
4	81·00	92·00		5·00	32·00
4¼	91·00	103·00		5·50	37·00
5	103·00	114·00		6·00	43·00
5½	116·00	129·00		6·50	48·00
6	134·00	148·00		7·00	55·00
7	160·00	176·00		8·00	69·00
8	199·00	219·00		9·40	83·00
9	230·00	255·00		10·00	..

No Charge for Boxing & Cartage.

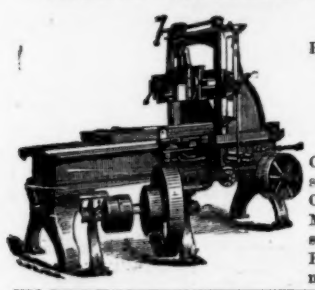
It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the above list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

JUNIUS JUDSON & SON, Rochester, N. Y.

The Pratt & Whitney Co.,

Hartford, Conn.,

Have constantly on hand and making



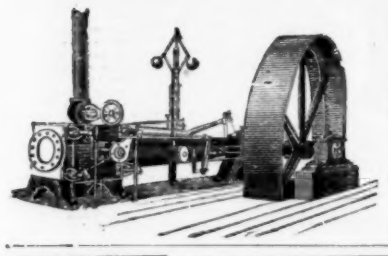
Drop Hammers

Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.

CORLISS STEAM ENGINE.

The Best in the World for Economy in Fuel and Cost of Running.

BUILT BY



Robert Wetherill & Co.,

Chester, Pa.,

Engineers, Machinists, Founders,

And BOILER MAKERS.

Stationary Engines, Shafting, Mill Gearing, Hoisting Machines, Improved Piston Packing and Machinery.

Special attention given to Boring Ports and Cylinders.

THORNE, DeHAVEN & CO.

21st Street, above Market,

PHILADELPHIA.

DRILLING MACHINES.

PORTABLE DRILLS. Driven by power in any direction, self-feed and convenient adjustment.

RADIAL DRILLS. Self-feed—large adjustable box table—separate base plate, every convenience.

VERTICAL DRILLS. Self-feeding—of new and improved designs.

MULTIPLE DRILLS. For boiler work, etc., 2 to 20 spindles, fed and returned by power or hand, together or separately.

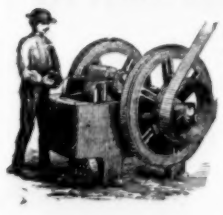
HORIZONTAL BORING AND DRILLING MACHINES. For large pieces—with boring head, adjustable, vertically and horizontally.

SPECIAL DRILLS. For special work. Gun Blank Drills, Coal Drills, &c, built to order.

BLAKE'S PATENT

STONE & ORE BREAKER.

New Pattern with Important Improvements & Abundant Strength



For reducing to fragments all kinds of hard and brittle substances, such as STONE for making the most perfect McADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS It is extensively in use in MINING operations, for crushing

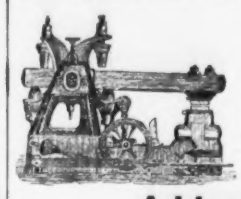
IRON, COPPER, ZINC, SILVER, GOLD, and other ORES.

Also for crushing **Quartz, Flint, Emery, Corundum, Feldspar, Coal, Barytes, Manganese, Phosphate Rock, Plaster, Soapstone, &c.**

For Illustrated Circulars, and particulars, address,

BLAKE CRUSHER CO., New Haven, Conn.

BRADLEY'S CUSHIONED HAMMER



Has Larger Capacity,

Is More Durable, takes up Less Room, does More and Better Work with less expense for Power and Repairs than any other Hammer in use.

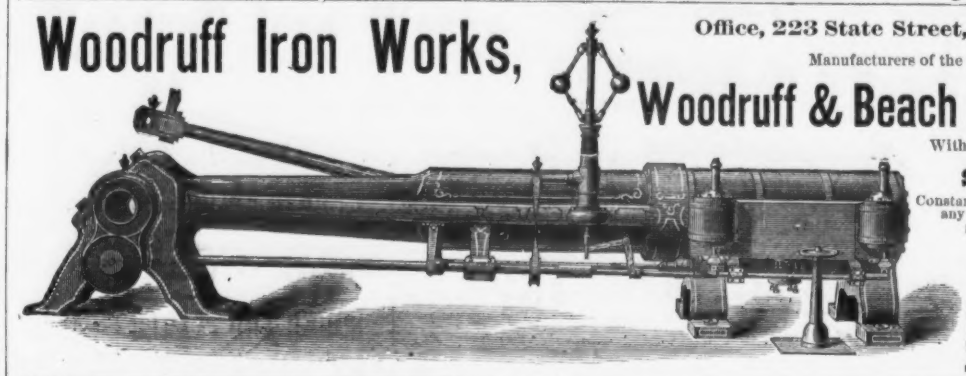
GUARANTEED as RECOMMENDED.

Address, BRADLEY MANUFACTURING CO., Syracuse, N. Y.

Woodruff Iron Works,

Office, 223 State Street, Hartford, Conn.

Manufacturers of the Celebrated



Woodruff & Beach Steam Engine,

With recent valuable improvements.

Steam Boilers

Constantly on hand and made to order any size or style. Special attention given to the manufacture of

MILL WORK

And all kinds of Machinery.

CASTINGS

Of any size or style. Direct all letters to **The Woodruff Iron Works, Hartford, Conn.**, as the Woodruff & Beach Iron Works and firm of Woodruff & Beach are both dissolved.

Knowles Patent Steam Pumps

MANUFACTURED BY THE

KNOWLES STEAM PUMP WORKS,

WARREN, MASS.

WAREHOUSES:

14 & 16 Federal Street, Boston, 92 & 94 Liberty Street, N. Y.

Cut above represents regular Boiler Feed Pump, No. 3 and 4. Showing New Patent Valve Motion, and Hand Power LEVER Attached and Detached.

FIRE PUMPS, a specialty.

Mining Pumps (both Double Acting Plunger, and Piston Pattern,) which we guarantee to run absolutely noiseless on any lift from 100 to 600 ft., at a single lift, a specialty. Pumps for every possible duty. Prices as low as any, and our workmanship and material altogether the Best.

Every machine furnished under a complete guarantee.

Morse Twist Drill and Machine Company,

New Bedford, Mass.,

SOLE MANUFACTURERS OF

MORSE PATENT STRAIGHT-LIP INCREASE TWIST DRILL.

BEACH'S PATENT SELF-CENTERING CHUCK.

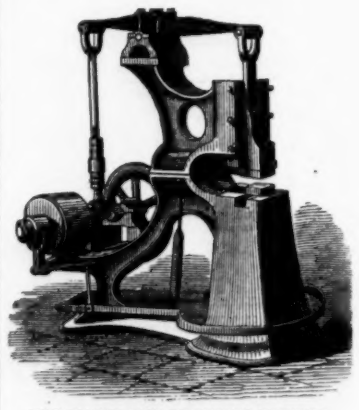
ALSO MANUFACTURE

SOLID AND SHELL REAMERS.

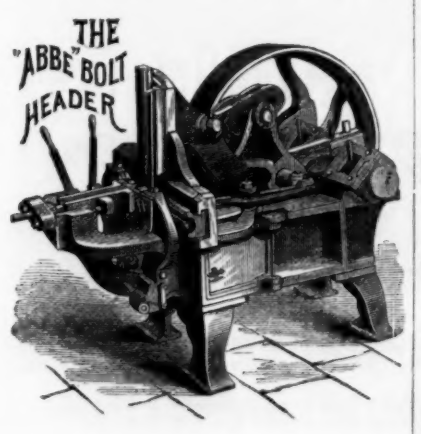
All Tools exact to Whitworth's Standard Gauge.

DRILLS MADE TO FIT ANY SOCKET DESIRED.

EDWARD S. TABER, Treasurer.



THE PALMER POWER SPRING HAMMER.



Of these Machines we are building sizes to meet the requirements of all Manufacturers and Workers of Iron and Steel. In simplicity, durability, ease of operation, accuracy, and range of work, we guarantee them superior to any Machines of their kind produced in the world. For prices, references, and full descriptive circulars, address

S. C. FORSAITH & CO.,

Manchester. N. H.

Whittier Machine Co.,

1176 Tremont St., Boston, Mass.

Manufacturers of

STEAM ENGINES, BOILERS, ELEVATORS and MACHINERY.

This Company has just received **the highest award, a Gold Medal, for Safety Elevators,** from the Massachusetts Charitable Mechanics Association.

CHARLES WHITTIER, Prest. JAMES STURGIS Treas.

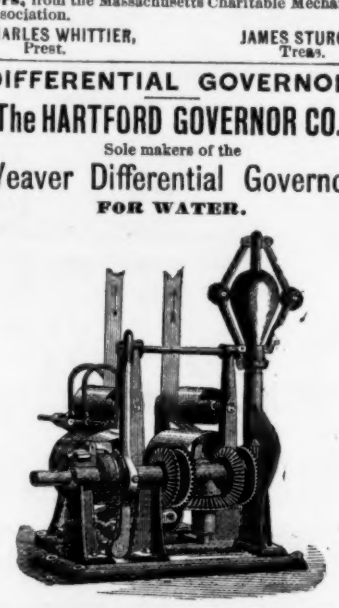
DIFFERENTIAL GOVERNOR.

The HARTFORD GOVERNOR CO.,

Sole makers of the

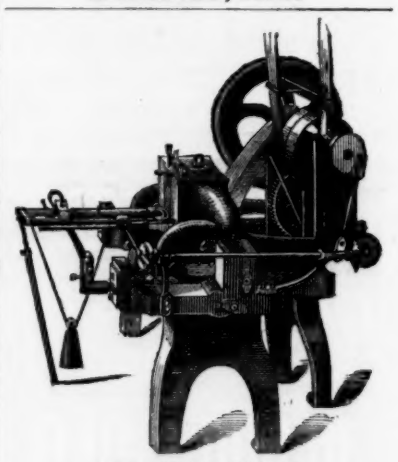
Weaver Differential Governor,

FOR WATER.



Powerful, positive, radically new. Introduced and working with complete success. Write us for circular, etc., at

HARTFORD, CONN.



AN IMPROVED

Self-Feeding and Double Heading

NAIL MACHINE.

Making 300 Nails per minute. Patent Rights for France, Great Britain, and the United States for sale. Send for Circular.

D. GUGISPERG, 84 Ave. B, N. Y.

HOLSKE MACHINE CO.,

279 Cherry St., near Jefferson St.

ELEVATORS

For Hotels & Stores a specialty.

Machinery in General made to order.

IMPROVED

Engine Lathes

SCREW MACHINES, &c.

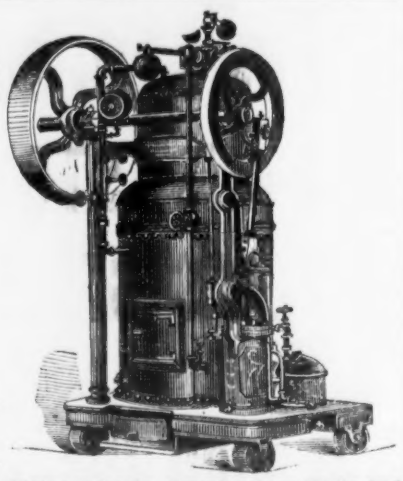
JONES, LAMSON & CO.,

Windsor, Vt.

Machinery, &c.

THE

Shapley Engine



Patented Feb. 10, 1874.

COMPACT,
PRACTICAL,
DURABLE,
ECONOMICAL.

$200·00.

Cheaper than any Engine offered of the same capacity.

MANUFACTURED BY

SHAPLEY & WELLS,
Binghamton Iron Works,
Binghamton, N. Y.

Manufacturers of **Steam Engines, Boilers, Water Wheels, Circular Saw Mills and Mill Work generally.**

Ludlow Valve Mfg. Co.,

OFFICE AND WORKS:

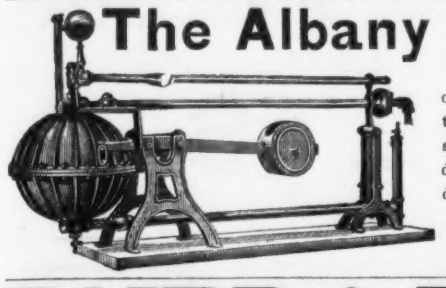
938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.,

VALVES

(Double and Single Gate, ¼ in. to 48 in.—outside and inside Screws, Indicator, &c.) for Gas, Water and Steam. Send for Circular.

Also FIRE HYDRANTS.

The Albany Steam Trap.



This Trap automatically drains the water of condensation from *Heating Coils,* and returns the same to the Boiler *whether* the Coils are *above or below* the water level in Boiler, thus doing awa with pumps and other mechanical devices for such purposes. Apply to

TOWNSEND & BLESSING,
Albany, N. Y.

BAIRD & HUSTON.

Established 1848.

Kensington Steam Engine AND Boiler Works.

Beach and Vienna Sts., Phila., Pa., U. S.

Builders of STEAM TUGS, STEAM YACHTS, RIVER STEAMERS, &c.
MARINE, (High or Low Pressure)
Stationary, Hoisting & Portable Engines & Boilers. Propeller Wheels.

Steam Pumping Machinery

OF EVERY DESCRIPTION.

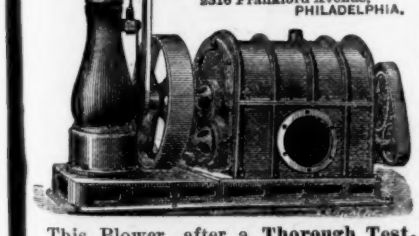
PHILADELPHIA HYDRAULIC WORKS, Cor, Evelina & Levant Sts., PHILA.

Send for Descriptive Price List.

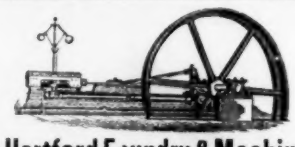
BAKER'S

Rotary Pressure Blower,

Warranted superior to any other, Rotary or Reciprocating. T. WILBRAHAM & BROS. 2316 Frankford Avenue, PHILADELPHIA.



This Blower, after a **Thorough Test,** was awarded the First Premium and Diploma over all others at the Franklin Institute Exhibition, Philadelphia, Oct. 8, 1874. No wood to shrink or swell in this machine, nor any sliding motions.



The Hartford Foundry & Machine Co

Successors to the

Woodruff & Beach Iron Works,

HARTFORD, CONN.

J. S. Hunter, Prest. E. J. Murphy, Treas. & Sec.

High and Low Pressure Marine & Stationary

STEAM ENGINES AND BOILERS,

Mining, Powder & Paper Mill Machinery,

And every variety of Iron and Composition Castings made to order.

The following are a portion of the Engines manufactured at these works, and are a sufficient guarantee of our capacity for doing first-class work, viz.: The Pumping Engines in the cities of Brooklyn, N. Y.; St. Louis Mo. and Hartford, Conn., and in the Charlestown, Mass. and Norfolk, Va. Navy Yards, and the engines in the U. S. Steam Sloops of War Michigan, Kearsarge, Manitou, Minnetonka and Piscataqua and the Gun Boats Cayuga, Pequot and Nepsic, the Government Transports Dudley Buck and Geo. C. Collins, and the Steamships America and United States. Also the large Horizontal Engine for the new Plate Mill of the Bay State Iron Co.

Write for Price List and Discounts.

EMPIRE PORTABLE FORGES

NO BELTS, BELLOWS OR CRANKS

The Best Made.

Send for Catalogue to the

Empire Portable Forge Co., Troy, N. Y.

PLANING AND MATCHING

BENTEL, MARGEDANT & CO.
HAMILTON, OHIO.
Send for Catalogue and Price List.

REESE'S ADJUSTABLE STENCIL LETTERS.

A simple device, by which any name or address can be formed in a moment, and be as readily distributed. For sale by hardware dealers & stationers. Send for circulars. East of Ohio, H. E. HALE & Co., 56 & 58 Park Place, N. Y.; Ohio & West, O. G. BRYANT, 102 Washington St., Chicago.

Machinery, &c.

Established 1848.

WM. SELLERS & CO.,

1600 Hamilton Street, PHILADELPHIA.,

Engineers, Iron Founders and Machinists.

RAILWAY SHOP EQUIPMENTS.

Our Steam Hammers, Lathes, Planers, Drills and Bolt Cutters
Are of Improved and Patented Construction.

Railway Turning and Transfer Tables,
SHAFTING & MILL GEARING, a specialty.

Pivot Bridges.

GIFFARD'S INJECTOR--IMPROVED, SELF-ADJUSTING.

Fairmount Machine Works,

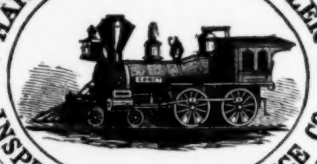
Office, 2106 Wood St., Philadelphia, Pa.

THOMAS WOOD, *Adjustable Self-Oiling Post Hanger 6 in. from post to center of shaft.*

MANUFACTURES AS SPECIALTIES,

POWER LOOMS, with (new) Patent Box Motion. SPOOLING, BEAMING, DYEING and SIZING MACHINES.
BOBBIN WINDING MACHINES—wind direct from hank or skein to shuttle bobbin.
SHAFTING, with Patent Adjustable Self-Oiling Bearings.
PLANS taken, and FACTORIES fitted out complete with Shafting and Gearing.
PULLEYS, from 4 inch to 10 feet diameter, of most Approved Pattern.
SELF-ACTING WOOL SCOURING MACHINES, (Yewdall's Patent.)
Machine and Foundry Work in all their branches. Send for Price List of Pulleys & Shafting.

HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO.



Issues Policies of Insurance after a careful Inspection of the Boilers

COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery,

ARISING FROM

STEAM BOILER EXPLOSIONS.

The Business of the Company includes all kinds of STEAM BOILERS

Full information concerning the plan of the Company's operations can be obtained at the

COMPANY'S OFFICE, HARTFORD, CONN.,

or at any Agency.

J. M. ALLEN Pres. W. B. FRANKLIN, Vice-Pres. J. B. PIERCE, Sec'y.

Board of Directors:

J. M. ALLEN, President.
LUCIUS J. HENDEE, Pres't Ætna Fire Ins. Co.
FRANK W. CHENEY, Ass't Treas. Cheney Brothers Silk Manufacturing Co.
CHARLES M. BEACH, of Beach & Co.
DANIEL PHILLIPS, of Adams Express Co.
GEO. M. BARTHOLOMEW Pres't Amer. Nat'l Bank.
RICHARD W. H. JARVIS Pres't Colt's Fire Arms Manufacturing Co.
THOMAS O. ENDERS, Sec Ætna Life Ins. Co.
EVERETT BRAINARD, o Case Lockwood & Brainard
GEN. WM. B. FRANKLIN, Vice Pres't Colt's Pat. Fi Arms Mfg. Co
AUSTIN DUNHAM, Pres't Willimantic Linen Co.
GEO. CROMPTON, Crompton Loom Works, Worcester
EARL P. MASON, Pres't Prov. & Wor. R. R., Prov.
WILLIAM ADAMSON, of Baeder, Adamson & Co., Philadelphia.
WM. B. BEMENT, of Wm. B. Bement & Co., Phila.
S. P. M. TASKER, of Morris, Tasker & Co., Philadelphia.
C. W. FREELAND, Treas. Dwight Manufacturing Co., Boston.

THEO. H. BABCOCK, Manager,
New York Branch, No. 1 Park Place.

THE AMERICAN DREDGING CO.

BUILDERS OF STEAM DREDGING MACHINES,

GUNPOWDER PILE-DRIVERS, &c.

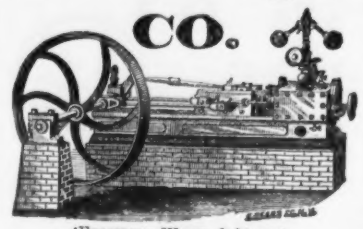
CONTRACTORS FOR

IMPROVING RIVERS AND HARBORS,
EXCAVATING CANALS,
RECLAIMING AND FILLING LOW LANDS,
PILING FOR FOUNDATIONS, PIERS, Etc.

Offices, No. 10 South Delaware Ave., Philad'a.

Machinery, &c.

UTICA Steam Engine CO.



(FORMERLY WOOD & MANN.)

STATIONARY & PORTABLE

STEAM ENGINES

The best and Most Complete Assortment in the Market.

These Engines have always maintained the very highest standard of excellence. We make the manufacture of Engines, Boilers and Saw Mills a specialty. We have the largest and most complete works in the country with machinery specially adapted to the work.

We keep constantly in process large numbers of Engines, which we furnish at the very lowest prices and on the shortest notice. We build Engines specially adapted to Mines, Saw Mills, Grist Mills, Canneries, Cotton Gins, Threshers and all classes of manufacturing.

We are now building the celebrated Lane Circular Saw Mill, the best and most complete saw mill ever invented.

We make the manufacture of Saw Mill Outfits a special feature of our business, and can furnish complete on the shortest notice.

Our aim in all cases is to furnish the best machinery in the market, and work absolutely unequalled for design, economy and strength.

Send for Circular and Price List.

UTICA STEAM ENGINE CO.,
UTICA, N. Y.

LATHES, PLANERS,

and other

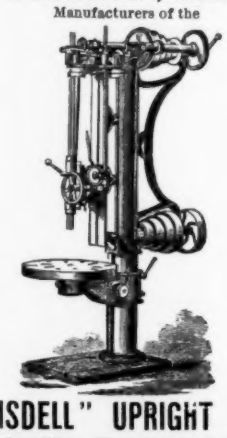
Machinists' Tools.

For Sale by

New Haven Mfg. Co.,

NEW HAVEN, CONN

P. BLAISDELL & CO.,
WORCESTER, MASS,
Manufacturers of the



'BLAISDELL" UPRIGHT DRILLS

And other First-Class Machinists' Tools.

JOHNSON'S PATENT UNIVERSAL

LATHE CHUCK.

We invite attention to the superior construction of this chuck. Its working parts are **absolutely protected from dirt and chips.** It is strong, compact and durable, and will hold the greatest variety of work, as the jaws are adjustable with a range the full diameter of the chuck. For Price List address,

Lambertville Iron Works, Lambertville, N.J

Patented Steam and Hydraulic, April 1, 1868.

EAGLE PACKING,

Of various sizes for **ENGINES and PUMPS,** manufactured by JAMES GLANDING & CO., No. 115 Queen St., Philadelphia. What the proprietors claim for the Eagle Packing: 1. Its general adaptation to all purposes for which packing is used. 2. Its durability. It will outlast any other article in use. 3. Its cheapness. It can be furnished to the consumer at a lower rate than any other packing

TUBAL SMELTING WORKS,

760 South Broad Street, PHILADELPHIA.

PAUL S. REEVES,

MANUFACTURER OF

ANTI-FRICTION METALS

OF VARIOUS GRADES.

XXX	Metal Nickel Hardening	50 cts. ℔ lb	
XX	Metal Nickel Hardening	45 cts. ℔ lb	
X	Metal Copper Hardening	40 cts. ℔ lb	
1	" " "	35 cts. ℔ lb	
2	" " "	30 cts. ℔ lb	
C		25 cts. ℔ lb	
D, E, F	These metals are alloys of lead, with a large percentage of tin, antimony and copper, according to price.		20 cts. 18 cts. 16 cts.
G, H	These metals are the ordinary low priced Babbitt alloys, used where there is not much wear on the machinery, and where economy is required.		14 cts. 12 cts.

BRASS CASTINGS, 21 to 35c ℔ lb. | INGOT BRASS, 19 to 30c ℔ lb. | BRASS TURNINGS AND OLD METALS WANTED.

Plumb. Burdict & Barnard,

BUFFALO, N. Y.

MANUFACTURERS OF

BOLTS

COACH SCREWS.

SKEIN BOLTS,

CARRIAGE BOLTS,

TIRE, SLEIGH SHOE,

Machine and Blank Bolts.

FERNALD & SISE, N. Y. Agents, 100 Chambers St.

ESTABLISHED 1842.

WM. & HARVEY ROWLAND,

PHILADELPHIA,

P. O. Address: Frankford, Philad'a. | MANUFACTURERS OF ALL KINDS OF

Elliptic, Platform AND C Springs,

MADE EXCLUSIVELY FROM

SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

Swedish Tire, Toe, Blister and Spring Steel.

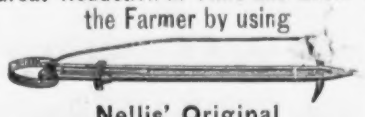
CAST SPRING AND PLOW STEEL.
CAST SHOVEL, HOE AND MACHINERY STEEL.

BESSEMER TOE, SLEIGH AND TIRE STEEL.
BESSEMER SHOVEL AND PLOW STEEL.
BESSEMER MACHINERY AND CULTIVATOR STEEL.

RE-ROLLED NORWAY SHAPES.
NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.

NEW TIME TABLE.

Great Reduction in Time and Labor to the Farmer by using



Nellis' Original
HARPOON HORSE HAY FORK,

Nellis' Grapple.

Grapple and Pulleys; also, Nellis' Patent Stacker and Method of conveying Hay, Straw, &c. A ton of Hay can be delivered in three to five minutes to any part of Mow or Stack. The right of Stacker and Conveyer granted FREE to the Farmer purchasing our Horse Hay Fork and Fixtures during season of 1875.

With it Pulleys can be attached or detached to rafter or beam, without the use of a ladder.

NELLIS' PULLEY,

Improved Wrought Frame, Prepared Wood Wheel. Warranted superior to any Horse Fork Pulley offered in the market.

A trial of these goods will convince any farmer that he cannot afford to dispense with them, as their entire cost is often times saved by a single day's use.

Also manufacturers of all descriptions

Of Agricultural Steel & Iron,

Steel Tempered by Nellis' process to suit every kind of soil.

Prices and descriptive Catalogues of our goods furnished free. Address,

A. J. NELLIS & CO.,
Pittsburgh, Pa.

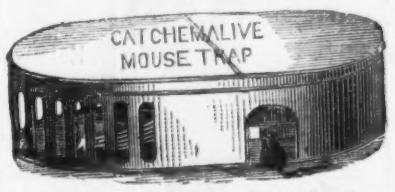
SEMPLE, BIRGE & CO., St. Louis, Mo.,
General Agents for the Southwest.

ESTABLISHED 1840.

R. E. DIETZ,

No. 54 & 56 Fulton, and
29 & 31 Cliff Street, New York,

Manufacturer of the



Each mouse caught resets the Trap for another.

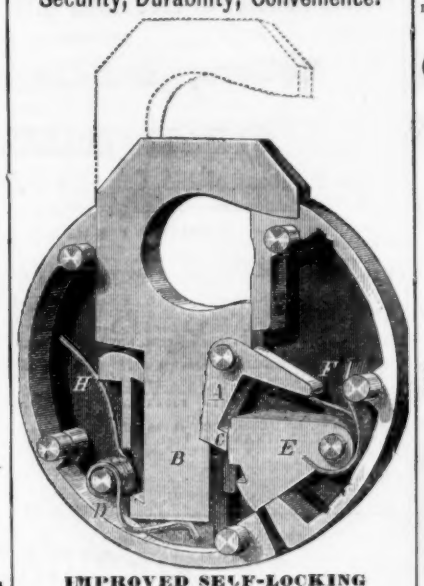
TUBULAR
And Other
Patent Lanterns
BRASS AND IRON
Jack Chains.

STANLEY G. FLAGG & CO.

PHILADELPHIA, PA.
Office and Warehouse,
No. 216 & 218 N. THIRD ST.
Manufacturers of
STEEL CASTINGS.
A Substitute for Steel and Wrought Forgings.
Circulars sent on application.

D. K. MILLER LOCK CO.,

712 Cherry St., Philadelphia, Pa.
Security, Durability, Convenience.



IMPROVED SELF-LOCKING
Brass Pad Locks.

Made in the most substantial and compact manner, and are in every respect a superior article. We guarantee that no two locks are alike, unless specially ordered. Each lock furnished with two keys. Any number of locks or keys made to order. Adopted by the United States Government. Samples of No. 1 Lock sent to all parts free, on receipt of $1.75. **Liberal Discounts to the Trade.**

GAS FIXTURES.

Lamps, Bronzes.

Equal to any made, in great variety, all of our own manufacture.

BRADLEY & HUBBARD MFG. CO.,
SALESROOMS:
21 & 23 Barclay, cor. Church St.,
NEW YORK.

SARGEANT MFG. CO.,

Manufacturers of
Saddlery Hardware
In Gold, Silver, Nickel, Japanned, Lined, & X C.

Sole Manufacturers and Patentees of various Patented Improvements, including **Gig Trees, "Imitation Covered Mountings," Wedge Buckles,** &c., &c.
75, 77 & 79 Summit St., NEWARK, N. J.

Established 1827.

DIXON'S CRUCIBLES,
DIXON'S STOVE POLISH,
DIXON'S GRAPHITE PENCILS.

For Sale by the trade universally.

Joseph Dixon Crucible Co.,

ORESTES CLEVELAND, Prest.

JERSEY CITY, N. J.

Russell, Burdsall & Ward,

PORT CHESTER, N. Y.

Manufacturers of

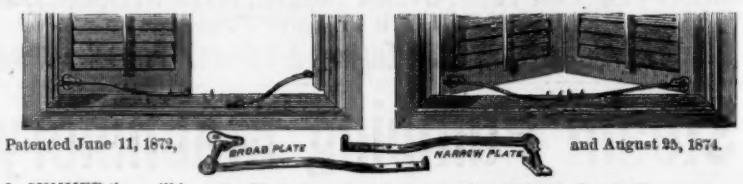
Carriage, Tire, Plow, Stove,
AND OTHER
BOLTS.

Carriage Bolts made from Best Square Iron, a Specialty.

THE "DOMESTIC" BLIND ADJUSTERS.

Hold the Blinds in any Position,

And Require No HOOKS OR CATCHES on the House.



Patented June 11, 1872, and August 25, 1874.

In SUMMER they will keep the Blinds bowed, or in any position desirable for shading a room, and in WINTER they enable them to be opened or closed *without reaching out of the window*, by simply raising the sash a few inches. **INVALUABLE FOR BAY WINDOWS.**

GRAY'S ADJUSTABLE BENCH CLAMP.

Easily Adjusted and Well Made.

Sizes	3	4½	6	8½	11 inches.
Per dozen	$4 00	5 00	6 00	7 00	8 00

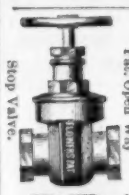
Manufactured by VAN WAGONER & WILLIAMS, 82 Beekman St., N. Y.

DERBY SILVER CO., Derby, Conn.,

Manufacture the most reliable

SILVER PLATED SPOONS & FORKS.

They are plated by weight, and not by time or guess, containing 20 per cent. more silver than the usual standard, on a base of Nickel Silver, and finished by hand. Each article is guaranteed by the trade mark and warranted to give full satisfaction. We ask of the trade a fair and impartial test, assuring them that the high standard already attained, shall be maintained. Send for Catalogue and Price.

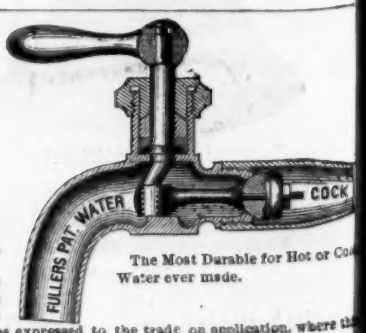


Schofield's Pat. Gauge Cock.

HENRY C. MEYER & CO.,
Manufacturers of
BRASS WORK
For Water, Gas and Steam.

Importers and Dealers in PLUMBERS' MATERIALS,
46 & 48 Cliff Street, N. Y.

Specialties manufactured and controlled by us: Fuller's Patent Faucets and Mineral Water Cocks; Murdock Hydrants and Street Washers; Flower's Open Way Valves; Schofield's Gauge Cocks; Hall's Lock Gas Cocks. Illustrated Catalogues expressed to the trade on application, where this advertisement is referred to.



The Most Durable for Hot or Cold Water ever made.

Supplement to The Monthly Iron Age.

To accompany the Number for July 1, 1875.

This sheet contains full Reports of the Hardware Market for the weeks Ending June 10, 17 and 24.

Hardware Review.

Week Ending June 10.

Although there is only a small business doing in General Hardware, a good deal of preparation is being made for the fall trade, the commencement of which is generally looked for before the close of July. The changes during the week are few. The manufacturers of Carriage Bolts held a meeting yesterday, and advanced the price of Common Carriage and Tire Bolts to discount 75 per cent. for small quantities, instead of 75 and 5 per cent., as formerly.

The Russell & Erwin Mfg. Co. have added to their line of specialties the Patent New England Sash Lock. This is the only Sash Fastener that we know of that locks securely both upper and lower Sash at any point. The following description of its working we take from the circular of the manufacturers.

Its novel feature is, it clamps both windows together as if done with a vise; with one motion it firmly holds both sashes in any desired position, so that rooms may be ventilated and windows remain locked. This is very desirable in upper rooms where there are children; the windows can be locked to keep them from falling out, and still give them sufficient room to look out, and for ventilation. Two, one right and one left, can be put in one window, if desired. It also prevents the windows from rattling and shaking, also dust from entering, and is as near burglar proof as any window fastening can be, inasmuch as it cannot be tampered with from the outside. It is not affected by the shrink or swell of the sash, is entirely out of sight, nothing being visible but the escutcheon and the handle; can be easily adjusted to houses and windows already built; it is strong enough to hold the windows, and can be used without weights or pulleys. One size will do for all kinds of sashes.

They are sold at the following list, which is subject to discount 30 per cent.:

No. 1, Japanned Lever and Plate	per doz.,	$2·25
No. 2, Bronzed Metal,	"	6·00
No. 3, Nickel Plated,	"	6·00

The Elmira Nobles Mfg. Co. quote Nobles Mfg. Co. Augers and Bitts discount 40 @ 40 and 5 per cent.; Nobles Mfg. Co. Axes, $10·50 per dozen, net; Drawing Knives, Adjustable Handles, discount 15 per cent.; and "Watrous" Ship Augers, discount 15 per cent.

There are no changes to report in the values of Foreign Hardware. Business is very quiet.

The Nail market is in much the same condition noticed last week. The demand is light, and we continue to quote 10d., in lots of 200 kegs and over, $3·25 net.

Henry Disston & Sons advertise this week their well known Cross Cut Saws "The Great American," "The Lumberman," The "Climax," and The "Nonpareil." These goods are too well and favorably known to require much mention. We are informed that there will be no change in prices for the coming season. The Skew Back Hand Saws recently introduced by them are having a large sale, and the manufacturers are now making up a stock of these goods for the coming season.

John Crane, 103 Chambers street, agent for the Greensboro Handle Works, has issued an illustrated catalogue of the goods of their manufacture. Beside a full line of Axe, Pick and Sledge Handles, Mallets and everything pertaining to this branch of the trade, they ask particular attention to their line of Carriage Wood Work. At their New York office they carry only such goods as are necessary to fill orders for immediate shipment; large orders are filled from the factory direct.

Week Ending June 17.

Trade continues exceedingly dull, and very few changes have occurred in lists or discounts since we last went to press. In Foreign Hardware there is nothing to report except that it participates in the general dullness usual at this season.

The Nail manufacturers represented in this city held a meeting on Thursday last, and adopted the new card rate based on 10d. at $3·50, which will be found below. This scale does not affect the selling rate, and was made with a view of bringing the card and the actual price a little nearer than they have been. There is no improvement in the demand for these goods, which we continue to quote at $3·25, net, for 10d., in lots of 200 kegs and over; for smaller lots, $3·30 @ $3·40 is the asking rate, according to quantity. The following is the new card:

COMMON, FENCE AND SHEATHING.

	Per keg.
4d. to 6od	$3·50
3d. and 9d.	3·75
6c. and 7d.	4·00
6c. and 5d.	4·25
4d.	5·00
3d. fine	5·75

COOPERS' SLATING AND TOBACCO.

6d. and larger	$4·00
4d.	4·25
6c. and 7d.	4·50
6c. and 5d.	4·75
6d. Slating	5·50
Spikes, of all sizes	3·75

BOX AND FLOORING.

6d. and larger	$4·25
4d.	4·50
6c. and 7d.	4·75
6c. and 5d.	5·00

BRADHEAD OR FINISHING.

6d. and larger	$4·50
4d.	4·75
6c. and 7d.	5·00
6c. and 5d.	5·25

Fine Finishing, $1·25 a keg above same size Common.

CLINCH NAILS.

	½ kegs.
6d. and larger	$5·00 $2·75
4d. and 2¾ in	5·25 2·88
6c. and 2¾ in	5·50 3·00
2½ in	5·75 3·13
2 in	6·00 3·25

Macomber, Bigelow & Dowse, Boston, Mass., have issued, under date of 14th inst., the following reduced price list of Young's Improved Silver Glass Knobs, for which they are sole agents. This list is subject to the following discounts to the trade:

Less than 6 dozen	45 %
6 dozen in one order	45&5 %
12 dozen in one order	45&10 %

YOUNG'S IMPROVED SILVER GLASS KNOBS.

	Per dozen.
Inside Silver Glass	$12·00
Inside Silver Glass, and Porcelain, Porcelain Rose	9·50
Inside Silver Glass, and Porcelain Plated Rose	9·50
Inside Silver Glass, and Mineral	9·00
Outside Silver Glass	12·00
Outside Silver Glass, and Porcelain, Porcelain Rose	9·50
Outside Silver Glass, and Porcelain Plated Rose	9·50
Outside Silver Glass, and Mineral	9·00
Inside Silver Glass, Cut	24·00
Inside Silver Glass, Cut, and Plain Silver Glass	18·00
Inside Silver Glass, Cut, and Porcelain, Porcelain Rose	15·50
Inside Silver Glass, Cut, and Porcelain Plated Rose	15·50
Inside Silver Glass, Cut, and Mineral, Plated Trimmings	15·00
Outside Silver Glass, Cut	24·00
Outside Silver Glass, Cut, and Plain Silver Glass	18·00
Outside Silver Glass, Cut, and Porcelain, Porcelain Rose	15·50
Outside Silver Glass, Cut, and Porcelain Plt'd Rose	15·50
Outside Silver Glass, Cut, and Mineral, Plated Trimmings	15·00
Outside Plain Glass, Silver Center	20·00
Inside Plain Glass, Silver Center	20·00

Closet Knobs.

Silver Glass Closet Knobs	6·00
Silver Glass, Cut, Closet Knobs	14·00
Porcelain, Plat'd Trim'ings, Closet, "Young's Patent,"	5·00
Mineral, Plated Trimmings, Closet, "Young's Patent"	4·00

Bell-Pulls.

Silver Glass Bell-Pulls	10·00
Silver Glass, Cut, Bell-Pulls	14·00
Plain Glass, Silver Center, Bell-Pulls	12·50

Shutter Knobs.

Silver Glass Shutter Knobs	5·00

Porcelain and Mineral Knobs.

Porcelain, Plated Trimmings, "Young's Patent"	7·00
Mineral, Plt'd Trimmings, "Young's Patent"	6·00
Outside Silver Swivel Spindles, extra	4·50

The Peerless Door Spring Co., Cincinnati, Ohio, have issued an illustrated price list of their goods. The "Peerless Reversible" Door and Gate Springs were patented January 27th, 1874, by J. H. Fitzgerald, and by him introduced to the trade prior to the date of his patent, and the formation of the above named company. They claim for these springs that they are more easily adjusted than any other door spring on the market. By a novel arrangement of the fastening devices the tension of the spring can be changed to either close the door or hold it when opened. They are made in a variety of styles and designs, Coppered, Japanned, Galvanized, Bronzed and Nickel Plated, and are packed in strong paper boxes, one dozen in a box, with full directions for applying them. The following is their list, which is subject to discount 25 per cent. for Coppered, Japanned, Galvanized and Bronzed Door Springs, and 15 per cent. for Nickel Plated.

PRICE LIST OF THE "PEERLESS" REVERSIBLE DOOR AND GATE SPRING.

Coppered.

	Without Screws.
No. 8 plain	per doz., $4·00
No. 7 "	" 4·50
No. 6 "	" 5·00

The castings and springs perfectly coppered.

Japanned.

	Without Screws.
No. 8 plain	per doz., $4·50
No. 7 "	" 5·00
No. 6 "	" 5·50

These are japanned perfectly, and for general use we recommend them as the best

Galvanized.

	Without Screws.
No. 7 plain	per doz., $6·00
No. 6 "	" 6·50

Introduced especially for gates, or where exposed to the weather, warranted not to rust. Only the two stronger sizes made.

Bronzed—Polished Edges.

	With Screws to match.
No. 8 ornamented	per doz., $6·00
No. 7 "	" 6·50
No. 6 "	" 7·00

Finished in the very best style. Castings Bronzed with polished edges, the springs japanned to match.

Nickel Plated.

	With Screws to match.
No. 8 Plain	per doz., $7·00
No. 7 "	" 7·50
No. 6 "	" 8·00
No. 8 Ornamented	" 7·50
No. 7 "	" 8·00
No. 6 "	" 8·50
No. 5 New Design, very large	" 21·00

Fuller Brothers, Nos. 89 Chambers and 71 Reade streets, have been appointed sole agents for the Files of the Auburn File Co., which they offer to the trade at $5 to £ currency.

Joseph S. Fisher, 411 Commerce street, Philadelphia, quotes "Spencer's" Files at $5 to £, gold, formerly $5·25.

A. Field & Sons, Taunton, Mass., have removed their warehouse in this city from No. 35 to No. 78 Chambers street, between Broadway and Church street.

Horace Durrie & Co., Nos. 97 Chambers and 81 Reade streets, have just received from the printers hands their new illustrated catalogue and price list. This book is substantially bound in a flexible cloth cover, it contains 83 large pages, printed on heavy tinted paper and is very fully illustrated. The lists of the following manufacturers who are represented by this house are given in full: Rhode Island Horse Shoe Co., Horse and Mule Shoes; Perkins Horse Nail Co., Horse Nails; The Winsted Hoe Co.'s Forged Toe Calks, Planters' Hoes, &c.; L. Coe's & Co., Wrenches; T. H. Witherby Tool Co., Chisels, Drawing Knives, &c.; Henry B. Beecher, Augers and Bits; Boston Belting Co., Machine Belting, Steam Packing, Hose, &c.; M. H. Jones & Co., Axes and Edge Tools; Wheeler, Clemson & Co., Files, &c.; Pioneer Flax Mills, Twines; Ohio Butt Co., Cast Butts; Eagle Anvil Works, Anvils and Vises; Stephens & Co., Rules; Auburn Tool Co., Planes, &c.; J. Auer & Co., Wrought Iron Goods; Tuttle Mfg. Co., Cast Steel Farm and Garden Tools of every description. In addition to this book they furnish, on application, a special price list of the goods manufactured by the Wheeler, Madden & Clemson Mfg. Co., of Middletown, N. Y., for whom they are agents.

We invite attention to the advertisement of Adam Weber, No. 633 East Fifteenth street, successor to, and former partner of, Maurer & Weber, manufacturers of fire brick and enameled clay retorts. Mr. Weber, having bought out the entire establishment, including the property at Perth Amboy, will, through the introduction of additional labor-saving machinery and kilns, be able henceforth to turn out 6000 bricks a day.

Week Ending June 24.

There is no improvement to notice in the demand for General Hardware, and few changes in quotations have occurred since our last review.

In Foreign Hardware there is little or nothing doing, and no changes in values to report.

The Nail market continues in the same condition noted last week. We continue to quote 10d. at $3·25 per keg for lots of 200 kegs and over; for smaller lots $3·30 @ $3·40 is the asking rate, according to quantity.

On the 18th instant Burden's Horse and Mule Shoes were reduced 75 cents per keg. The following are the net prices of these goods in Troy, N. Y.:

Horse Shoes 4¼ cents per pound.
Mule " 5¾ " "

The quantity discounts from the invoice price of Burden's Horse and Mule Shoes are:

500 kegs dis. 2 per cent.
1000 " " 3 "
1500 " " 4 "
2000 " " 5 "
} In current year, payable January, 1876.

The Rhode Island Horse Shoe Co. have issued the following circular:

OFFICE OF THE RHODE ISLAND HORSE SHOE CO.,
PROVIDENCE, R. I., June 19, 1875.

Our present prices for Horse and Mule Shoes in New York are as follows:

	Per keg, cash.
Perkins Pattern	$4·87½
Rhode Island Pattern	5·87½
" " City	5·87½
Mule Shoes	5·87½
Perkins Trotting or Snow Shoes	6·62½

Horace Durrie & Co., 97 Chambers and 81 Reade streets, New York, are our only agents for the sale of our Horse and Mule Shoes, and they are authorized to sell, at all times, at our lowest factory prices. A full assortment of our Shoes we purpose to keep in their store, ready for immediate delivery.

RHODE ISLAND HORSE SHOE CO.

George W. Bruce, No. 1 Platt street, has issued a circular under date of 19th instant, in which he quotes Burden's Horse Shoes $4·87½, and Mule Shoes $5·87½ per keg. Union Horse Shoe Co.'s Mule Shoes, Nos. 1, 2 and 3, assorted, in keg $5·25 per keg, and No. 3 alone $4·50 per keg, net cash.

The following circular explains itself:

NEW YORK, June 15th, 1875.

GENTLEMEN: A recent agreement with the Auburn Tool Company gives us the exclusive sale of their Planes in this market, and consequently all orders for their goods, to receive prompt attention, should be submitted to us direct.

We purpose to keep a full line of their Planes, all kinds, in stock, which we guarantee to furnish at all times at lowest factory rates.

Yours, truly,
HORACE DURRIE & CO.

The Stamped Ware Manufacturerers Association of the United States held their annual meeting in this city on Tuesday, 22d instant. The attendance was large and the meeting harmonious. The only business of importance to the Hardware trade transacted was an advance in the price of Deep Stamped Ware to discount 20 per cent., formerly discount 25 per cent. In Common Stamped Ware no changes were made in either lists or discounts. The trade are aware that, although the market for Tin Plates of small sizes has for a long time been weak and in buyers' favor, still the advance in the gold premium has about equalized the net figures with those ruling six months ago, but the larger sizes of Tin Plates, and the extra qualities required for deep stamping, have been held all along at firm and unchanged figures. The advance in the gold premium has borne heavily on the manufacturers using these higher grades of Tin Plates, and hence the action taken at their meeting yesterday.

We invite the attention of the trade to the advertisement, on another page, of "The Buffalo Stove Boards," manufactured by Sidney Shepard & Co., Buffalo, N. Y. These goods have been before the public for several years, and are highly spoken of by dealers and consumers. They are offered to the trade at the following list, which is subject to discount 35 per cent., instead of 30 per cent., as formerly:

ROUND.

	Each.		Each.
24 inch Round	$1·35	32 inch Round	$2·25
26 "	1·50	34 "	2·50
28 "	1·75	36 "	3·00
30 "	2·00	40 "	4·00

SQUARE.

	Each.		Each.
22 inch Square	$1·40	30 inch Square	$2·25
24 "	1·50	32 "	2·50
26 "	1·75	34 "	3·00
28 "	2·00	36 "	3·50

OBLONG.

	Each.		Each.
24x28 inch Oblong	$1·75	32x40 inch Oblong	$3·00
26x30 "	2·00	32x44 "	3·50
28x32 "	2·25	34x45 "	3·75
30x36 "	2·50	34x48 "	4·00
30x42 "	2·75	34x42 "	4·00
32x36 "	2·75	36x48 "	4·50

The superiority of material and construction of these Stove Boards are now acknowledged by all. We advise customers to select by carefully measuring their Stoves. The Boards should be three inches, at least, longer than the compass of the Stove legs.

NOTE.—Full cases contain 24 Boards of each kind.

The Hazard Powder Co., No. 88 Wall street, in a card issued under date of 19th instant, say: "Should you desire a cheaper powder than our 'Enfield Rifle' (Deer) for 'Fourth of July,' we are prepared to supply you with our 'A' brand, fine grains, at $3·25 per keg."

We learn the Nicholson File Co.'s stock of Files has been much reduced, being now quite light, and that no reduction in prices is looked for at present. They say that their new net list of January 1, 1875, being an average some 15 per cent. discount from the $5 to £ list, has become quite popular, and is fast superceding that ancient and honorable document which history informs us took some six months' time of upward of 5000 Sheffield File makers (say nothing of the talent and intelligence of the Cutler's Association) to compile during the year 1872. The Hart, Bliven & Mead Manufacturing Co., 18 and 20 Cliff streets, New York, are the sole agents for these goods.

The Northampton Cutlery Co., No. 45 Murray street, have issued the following card under date of 10th instant.

Mr. Theodore Weed assumes the management of the business of this Company, at No. 45 Murray street, New York, Mr. D. P. Griffith having this day retired from the position.

In making the above announcement, we gratefully acknowledge the many favors and liberal patronage of our friends and dealers in Cutlery, etc., and respectfully solicit a continuance of the same. Very truly,

NORTHAMPTON CUTLERY CO.

Mr. Weed is long and favorably known to a large number of our readers; he purposes calling on his out of town friends during the coming season.

The Union Nut Co., 78 Beekman street, invite the attention of the trade to their Cast Steel Corn Hooks. The blades are polished and ground to a sharp cutting edge ready for use; the handles are of first class timber with square end, and are firmly strapped and riveted to the blade. They are packed in barrels of 7 dozen each. These goods are very clearly illustrated in their advertisement on page 33. They also illustrate in the same place Rules and Levels manufactured by the Standard Rule Co., for whom they are agents.

We invite the attention of capitalists to the advertisement of "Manufacturer," which will be found among "Special Notices" on opposite page. Although we are not at liberty to give any further information regarding this matter than is to be found in the advertisement, we are free to say that this is a *bona fide* offer, and in every way worthy the notice of capital seeking investment.

The subject of trade marks has occupied a good deal of our space from time to time. The following extract translated from the proceedings of the police court, Hamburg, on the 3d of May, 1875, in the matter of the prosecution of Carl Schulcke, for "criminal appropriations" is of interest to the trade:

"The Court doth adjudge that the accused, Alexander Bastian, partner in the firm of Carl Schulcke be condemned for a 'criminal appropriation,' under section 287 of the Penal Code, to a fine of 150 marks and to payment of the costs, and in default to ten days' imprisonment—(Signed) HOMANN Schrader. Certified. (Signed) HOMANN.—'L. S.,' seal of the Hamburg Court of Inquiry.

"REASONS.

"The accused confesses to have ordered, through the agent, Bleecher, from the house of Fr. Nief Sons, of Solingen, a quantity of knives stamped with an imitation of the firm and mark of Joseph Rodgers & Sons, of Sheffield, and after importation here, shipped them to China for retail sale there. It is thereby established that the accused has knowingly trafficked in knives falsely marked with the names of a Sheffield manufacturer, an offense punishable according to section 287 of the Penal Code, since mutuality is secured by the English Law of the 7th August, 1872 (an Act to Amend the Law relating to the Fraudulent Marking of Merchandise).—Since already a fine of 50 thalers has been adjudged against Nief Sons, an equal fine necessarily seems proper as against the accused.

"CAUTION.

"In August, 1874, a case of Cutlery was seized at the Custom House, London, on its way from Hamburgh to Shanghai, bearing the marks:

"RODGERS, Cutlers to Her Majesty."
"No. 6 Norfolk street."

Messrs. Joseph Rodgers & Sons, Limited, having ascertained that the goods had been ordered by Carl Schulcke & Co., of Hamburg, from the firm of Fr. Nief & Sons, of Solingen, and sent to an agent in London for trans-shipment per the Hong Kong to Shanghai, proceeded against those parties for illegal appropriation under Article 287 of the German Penal Code. On the 2d December, 1874, at the Tribunal of Correctional Police, at Elberfeld, Ernst Nief, the partner in the firm of Fr. Nief & Sons, was condemned and sentenced to pay a fine of 50 thalers and costs, or 10 days' imprisonment. And on the 3d May, 1865, at the Police Court, Hamburg, Alexander Bastian, partner in the firm of Carl Schulcke, was condemned, under Section 287 of the Penal Code, to a fine of 150 marks and payment of costs, or in default, 10 days' imprisonment.

The Sheffield *Telegraph* of the 27th ultimo contains the following remarks on this case:

Whatever faults may be found with the Germans, it is impossible not to give them credit for an admirable thoroughness. When they pass laws they mean that those laws shall be carried out. Some other countries favor legal enactments which only cumber the statute books and tend to demoralize the people who habitually break them. The American liquor laws are a farce; the law against the smoke nuisance is in Sheffield and other large towns of England an utter and disgraceful failure. There are districts in England where the recent education act still remains a dead letter. The Germans do not believe in this sort of thing. Their system is inexorable, their logic remorseless. When they lay down rules they mean that those rules shall be obeyed—and woe to the man who breaks them. Germany recently took up the trade marks question. The authorities determined that the appropriation by one maker of the name and good fame of another should be regarded as a criminal transaction. They decided that it was not right that John Schmidt should palm off upon his customers at Dusseldorf or elsewhere, as Sheffield goods, knives and other articles of his own manufacture. They declared that the piracy of trade marks should be regarded as a grevious offence, as a means of robbing the purchaser of his money and the honest manufacturer of his good name. Having come to this decision, they carry it out. They do not hesitate to carry their logic to its consequences. They are not like certain English judges who have denounced in the strongest terms the immorality and injustice of one man stealing another man's trade-mark, but have decided five minutes after that if the man had gone on for some time with such a theft, it was not in the province of the law to stop him or punish him. It is not very long since the new law come into operation in Germany, but already we find that it is being put in force vigorously at Elberfeld, Hamburg and elsewhere. An extract translated from the proceedings of the Hamburg Police Court, shows that swift justice is being meted out to the pirates who, by making and selling base imitations of Sheffield goods, do their best to ruin the trade and spoil the good name of the Capital of Cutlery. It appears that a certain partner in the house of Carl Schulcke ordered from a German house a quantity of knives stamped with an imitation of the style and trade mark of Joseph Rodgers & Sons, Limited, of Sheffield. This being brought home to the accused, a fine was inflicted—with the alternative of imprisonment—and a caution was given to other offenders. There are a good many Sheffield manufacturers who wish that the action of our English law courts in trade-mark cases were as prompt and unflinching as that of the German tribunals.

The following circular explains itself:

FLORENCE, Mass., May 28, 1875.

DEAR SIR: Our attention has been called to a circular issued by Mr. Geo. B. Turrell, president of the Union Hardware Company, dated April 17, 1875, in which he says that by virtue of an assignment of the patent granted to John Lovatt, for improvement in Skates, dated May 29, 1860, and reissued April 6, 1875, No. 6369, he claims: "The exclusive right to manufacture and sell all Skates in the United States that fasten to the boot or shoe by means of clamps grasping the sole; also, all that grasp both the heel and sole of the boot or shoe, when the clamps are moved and held by suitable mechanism." He also warns all manufacturers and dealers in Skates that infringers upon these rights will be held amenable to the law for damages.

To this broad claim of Mr. Turrell we beg leave to offset the following extract from the application for this same reissue of the John Lovatt patent, No. 6369, viz.:

"Before this invention a Skate had been made with clamps to hold the Skate to the sole and heel of the boot or shoe, and such clamps were movable, to accommodate varying sizes of boots and shoes, and retained in position by bolts and nuts that held the clamps to the sole or heel plates."

The Florence Clamp Skates involve several inventions of Gen. Oliver Edwards, which are secured by Letters Patent. They do not infringe the patented inventions of any one else. The use of clamps as parts of a Skate by which to fasten it to the sole and heel of the boot or shoe is older than any existing patent, and no one can rightfully claim that he is entitled to an exclusive use of clamps for this purpose, as his private property.

Patents for combinations cover only the combination of parts shown in the specifications, and are not infringed by the use of some of the parts named, in combination with parts more recently invented. No re-issue of an old patent can stretch it so as to cover devices invented after the patent was first applied for. No Skate infringes the re-issue of John Lovatt's patent of May 29th, 1860, re-issued April 6th, 1875, No. 6369, which does not contain his particular mechanism for fastening the clamps, any pretense set up by the holders of that patent to the contrary notwithstanding.

All dealers in the Florence Skates are hereby notified that this Company will protect its rights as against the assumptions and claims of any rival manufacturers.

We shall be prepared with our descriptive Skate list for the next season about the first of July, when we shall wait upon you again.

Our new Clamp Skates are the only Skates made that fasten securely to the boot or shoe, and at the same time hold the feet firmly within the boot or shoe.

Respectfully yours,
FLORENCE SEWING MACHINE CO.
WILLIAM B. HALE, President.

A Colossal Statue in Beaten Copper.—Some thirty or forty years ago, when the Unity movement had barely commenced, Herr Ernst von Bandel, a Westphalian nobleman, devoted to the sculptor's art, conceived the patriotic idea of erecting a gigantic statue to Hermann, the vanquisher of Varus in the Teutoburg Forest. A grand national monument, the statue was to reach the enormous proportions of 100 feet, not to speak of pedestal and base; and as it was to be placed on the top of a hill, the site of victory, the difficulty of getting it in position not a little added to the magnitude of the undertaking. In spite of all obstacles, what appeared a chimera thirty years ago has now become a reality. Assisted by wealthy friends and occasional public subscriptions, Herr von Bandel has completed the figure, and in two months expects to witness the solemn inauguration of his monument by the German Emperor. The statue is of embossed copper, and has been wrought by the hand of the man whose brain created it. His whole life has been consumed in this one object. When he had done modelling—no small task in the case of a figure with hands 5 feet long—he took to the hammer and forge, and literally formed the immense surface with his own unaided strength. A good deal of it was done at the foot of the hill whereon it stands, the sculptor having built himself a forge and a hut close to his chosen locality. To judge from the head, which was exhibited ten years since, Germany will possess not only the largest but also one of the best statues in Europe. This eighth wonder of the world will tower over the famous oak woods near Detmold, the capital of the principality of Lippe. The figure of an eagle wrought in copper in the same way was shown in London a few years ago at one of the international exhibitions, and was afterward on view for some time at the Crystal Palace.

"Something Like Tyranny" at Sheffield.—The London *Builder* reports an act which is appropriately described as "something like tyranny." A working scissors grinder in Sheffield saved up his earnings for the purpose of becoming a master-man in a small way. He bought the necessary machinery, and commenced to *make* scissors as well as grind them. On the night succeeding the day on which he commenced as master-man his workshop was broken into, his wheel band cut into shreds, four "lads" and "glazers" destroyed, three grinding stones smashed to pieces, and his little venture was utterly ruined. The suggestion as to the cause of this atrocious act is that he had not consulted the Sheffield union or got their permission to become master.

The Iron Age

Published by DAVID WILLIAMS, 10 Warren Street, New York.

RATES OF SUBSCRIPTION, POSTPAID, TO SUBSCRIBERS IN THE UNITED STATES AND CANADA.

Weekly Edition, ... $4·50 a year.

Issued every THURSDAY Morning. Contains full Trade Reports for the week, brought up to the close of the previous day.

Semi-Monthly Edition, ... $2·30 a year.

Issued the FIRST AND THIRD THURSDAYS of every month. Contains a full review of the Trade for the previous half month.

Monthly Edition, ... $1·15 a year.

Issued the FIRST THURSDAY of every month. Contains a full Review of the Trade for the previous month.

The Iron Age is by far the largest newspaper in the world, each issue (whether Weekly, Semi-Monthly, or Monthly) consisting of thirty-six large five-column pages, containing about fifty columns of carefully prepared reading matter, all of which is of particular interest to the Hardware and Metal Trade, beside more than eleven columns of Hardware and Metal Quotations, corrected carefully every week. The paper is taken and consulted for its **valuable trade information** by a large majority of the respectable houses in the trade, by whom it is prized as the best means of keeping posted, and one by which they are enabled to make money. No house, even in this city, is so well informed that it does not often find in its columns important news, and no country dealer does so small a business that he cannot save by its use a considerable amount every year. Its quotations of prices are considered authority in all parts of the country. For the smaller dealers, who can afford to wait for some of their information, the Semi-Monthly and Monthly editions are very desirable, and all are incomparably cheap. Ever since the beginning of the war, the prices of Hardware and Metals in this country have been constantly fluctuating, and no merchant can either buy or sell to the best advantage unless he keeps himself informed of the changes in lists and discounts, as well as the general course of the market. That *The Iron Age* gives this information is proved by the fact that its subscription list has for years steadily increased, until now it contains the names of by far the largest and most influential portion of the trade, and subscriptions are almost invariably renewed. Particular attention is asked to the extracts from letters given below.

EXTRACTS FROM LETTERS.

The following testimonials to the value of THE IRON AGE were given without any solicitation whatever, being, with a few exceptions, extracts from letters enclosing remittances for the renewal of subscriptions:

From WATTS & METCALFE, Hardware Merchants Paris, Ont., Canada:

JUNE 20, 1874.—"We are much satisfied with paper. It has enabled us to save considerable by purchasing goods on your side."

From J. B. WILSON, Iron and Brass Founder and Machinist, Detroit, Mich:

JUNE 19, 1874.—"I find I would not like to be without it now."

From E. C. SHELDON, Hardware, Sherman, N. Y.:

JUNE 19, 1874.—"Don't know how to get along without *The Iron Age*."

From SAGER ASHWORTH, Lowell File Works, Lowell, Mass.:

MAY 12, 1874.—"We find that we cannot keep posted without your valuable paper. Consider us regular subscribers."

From ALLEN R. TURNER, Hardware, Oneida, N. Y.

MAY 4, 1874.—"I would not be without your paper for double the price."

From DILLER & LUGIBIHL, Bluffton, Ohio:

APRIL 21, 1874.—"We have been taking *The Iron Age* ever since we have been in business, and we find that we can't do without it. We can make it pay itself on almost every bill of goods we buy."

From GEO. H. LOOK, Hardware, &c., Prattsburgh, N. Y.:

APRIL 18, 1874.—"I made that amount ($4) clear, by reference to it the other day, on one bill of goods."

From STEWART & MONTGOMERY, Hardware and Iron, Rock Island, Ill.

APRIL 16, 1874.—"We hope to continue to receive your valuable paper, which we consider indispensable in our business."

From KETCHAM & VIOT, Hardware, Stoves and Tin, Toledo, Ohio.

APRIL 16, 1874.—"Should hardly know how to get along without 'our mutual friend' now. We do think it the best paper of the kind published anywhere."

From T. C. PINCKARD, Hardware, Troy, Alabama.

MARCH 30, 1874.—"I would not do without it for five times its price."

From C. O. JONES, Hardware, Stoves and Tin, Clinton, Ill.

MARCH 30, 1874.—"Your paper should be in the hands of all metal workers, it being the cheapest and best paper of the kind published."

From H. M. MOORE, Hardware, Covington, Tenn.

MARCH 17, 1874.—"Can not get along without your valuable paper."

From E. F. MACK & CO., Hardware, etc., Davenport, Iowa:

JUNE 23, 1874.—"We like your paper, and feel that we cannot keep house without it."

From TEAGUE & WILKINSON, Hardware, etc., Greenville, Ala:

JULY 18, 1874.—"Success to *The Iron Age*. We have ever seen any thing in its line comparable to it."

From H. W. JENNEY, Hardware and Stoves, Waterloo, Iowa:

"I could as well get along in my business without a screw list as I could without your valuable paper."

From LEWIS H. BECK (of Tommey, Stewart & Beck), Hardware, Atlanta, Georgia:

"I find *The Iron Age* a great advantage to me as buyer for our house."

From S. S. CASE & SON, Hardware, Stoves and Tin, Mauston, Wis.:

"We like your paper more and more every year."

From J. H. JONES & SONS, Hardware, Portland, Ind.

"We cannot get along without it."

From A. C. FAUST, Hardware, Atchison, Kansas:

The Trade Report in *The Iron Age* is worth many times the subscription price."

From GREGORY, COE & POLLOCK, Selma, Alabama:

"We would not be without *The Iron Age* for twice its cost."

From LINDSAY BROTHERS, Hardware, Biceville, Pa.:

"We find we cannot keep store without your paper."

From CHARLES W. POLLARD, Georgetown, Colorado Territory:

"I am very much interested in the contents of your excellent paper, but being so far from the center of business, your monthly edition gives me all the information in the way of prices that I can take advantage of."

From H. W. BROWN, Stoves, Tin, &c., Toms River, N. J.:

"Your paper is worth in valuable information more than treble the price."

From the POWHATTAN IRON COMPANY, Richmond, Va., by W. F. Bartlett, President:

Looking back to your rapid progress since we began to receive your paper a few years ago, it would be hazardous to say that the same rate of improvement will not be kept up; but it is equally difficult to say to-day wherein it could now be bettered, either in matter, material or manner of arrangement.

From R. G. MARTIN, Hardware, Monroeville, Ohio:

"I am very highly pleased with the late change in the form of your invaluable paper, as I am sure all of your numerous subscribers will be. I am also pleased with your style or manner of making improvements—that is, you go on and *make them* as you see proper, without blowing months in advance of what you intend doing, etc. Wishing you the success you so richly deserve, I remain an old and admiring subscriber."

From T. E. FELL & CO., Hardware, Newnan, Ga.

"We renew because we consider your paper invaluable."

From the OHIO BUTT CO., Joliet, Ills.

"Your paper is wonderfully improved, and you will please accept our thanks for same."

From J. H. BARLEY, BRO. & CO., Mfrs. Agricultural Implements, Sedalia, Mo.

"We are much pleased with your paper in its general information in our line of business."

From WHITMAN & BURRELL, Hardware, Little Falls, N. Y.

"We consider your paper a *very cheap* investment for us."

From P. P. JUDSON, Hardware, Waterford, Pa.

"Could not possibly keep house without your valuable paper."

From R. E. GRIZZARD & CO., Hardware, Trenton, Tenn.

"Your excellent paper is invaluable to us."

From WOODFORD & HATHAWAY, Hardware, Greensboro, Ky.:

"We are much pleased with the paper, finding much valuable information. We always, since taking your paper, feel ourselves posted in the Hardware and Iron Market."

From A. H. MUNSON, Hardware, Charlotte, Mich.:

"We owe you an apology for delay in sending subscription, and thank you for continuing our paper after our time had expired, as we prize it highly, and would not like to miss a single number. Your new form is a very decided improvement, and adds much to the value of the paper, especially for preservation."

From WM. MILNES, Jr., Manufacturer of Pig Iron, Shenandoah Iron Works, Va.:

"You certainly have made a decided improvement in the form of your paper; and as to its contents I think the paper well worth one of your best binders, so it can be taken care of properly. Among all the papers I take *The Iron Age* is the most welcome."

From BROWN, SON & Co., Steam Boilers, Engines, &c., Brookville, Pa.:

"We hope that encouragements will meet you on every hand. We consider *The Iron Age* THE paper of the day."

From GEORGE B. BULL, Proprietor Union Stove Works, Buffalo, N. Y.:

"I think, in its new dress, your paper is incomparable. Its general news, independent of its special matter affecting my interest, make it, in my humble opinion, the most readable and attractive paper in the world—reliable, also."

From FILER, STOWELL & CO., Cream City Iron Works, Milwaukee, Wis.:

"It is needless for us to express to you the high estimation in which we hold your excellent paper, but we cannot refrain from saying that no man interested in Iron or its products (and who is not?) can afford to do without it. We regard it as an *authority* in matters of which it treats, second to none *in the world*."

From OWENS & BARKLEY, Hardware, Mayerille, Ky.:

"*The Iron Age* is greatly prized by us."

From CLARK & DUNNINGTON, Wholesale and Retail Hardware, &c., Greencastle, Ind.:

"We could not do without it, if it cost ten times its present price."

From W. H. LEAVITT, Waterloo, Iowa:

"Your paper is invaluable."

From BRUSKE & SCHWARTZ, Wholesale and Retail Hardware, East Saginaw, Mich.:

"We cheerfully renew our subscription to the *The Iron Age*, as we find the quotations more reliable than any paper we have yet had, and have made hundreds of dollars in the past year by following its advice."

From DICKSON & CO., Hardware, Iron, etc., New Castle, Pa.:

"We find we cannot do without *The Iron Age*.

From C. D. STRONG & CO., Hardware, etc., St. Paul, Minn.:

"We find the paper a valuable auxiliary in our business."

From THOS. WHITSON & SONS, Hardware, etc., Woodstock, Ill.:

"Enclosed please find draft for four dollars for *The Iron Age*, which we think well laid out—paper as good as the best."

From C. C. CONE, late Hardware Dealer, McGregor, Iowa:

"I am making a change in my business, and shall not need the paper any longer; please discontinue it. I have taken *The Iron Age* for many years, and part with it reluctantly. Wishing success to the old friend, I bid it good bye."

From REMBERT & BRO., Brownsville, Mo.:

"When will our subscription be out? We will want it continued. We are very much pleased with the paper."

From LLOYD, SUPPLEE & WALTON, Hardware Factors, Philadelphia:

"Parties who have taken the advice given by *The Iron Age* during the last six months (to supply themselves early with goods) have been able to realize quite a fair profit from the recent weekly advances. We know many who have been fortunate enough in this respect, while others prefer only to buy for their daily wants, no matter what the prospect of advance may be."—Oct. 31, 1871.

From ANNAS & LEWIS, Hardware Merchants, De Ruyter, N. Y.:

"We like *The Iron Age* very much, and find it quite reliable in quotations. Save the price of the paper many times in the course of the year in knowing what to pay for goods. Please send it to us another year."

From F. W. HOFFMAN, Hardware, &c., St. Paul Minn.:

"As long as I am in business I cannot do without it."

From HOFFMAN, THOMPSON & CO., Iron Commission Merchants, Baltimore:

"Enclosed we hand you four dollars, renewal subscription to your (to us) *very useful* and *valuable* paper."

From C. H. BENTON, Fon du Lac, Wis.:

"Send along the '*Age*,' We have made up our minds that we cannot afford to be without it. *Consider us regular subscribers.*"

From B. F. ALLEN, Canon City, Colorado:

"I cannot do without *The Iron Age*, and for fear you will stop sending it, I enclose the amount of your bill for year, as no man engaged in the Hardware or Metal trade can afford to do without it."

From ALLISON BROTHERS, Wholesale Dealers in Hardware, Memphis, Tenn.:

"Your journal is not only invaluable to the trade as a review of the market, but is highly interesting to any one interested in the rapid improvements constantly going on in everything connected with our business. Appreciating the value of your journal to the trade, as well as your constant efforts to fully meet the wants of the intelligent reader, we would not be without it for greatly more than the present price."

From GEORGE A. WALLER, Dealer in Iron and Hardware, Portsmouth, Ohio:

"I find your paper very useful in my business."

From ALEXANDER SWINTON, Hardware Dealer, Nichols, Tioga Co., N. Y.:

"I could not do without *The Iron Age*. I consider it is a good investment, as I am often able to save two or three times the amount of subscription on a bill of goods, by being posted by it in prices and fluctuations of markets."

From CYRUS DYER, Dealer in General Hardware, Middletown, Pa.

"Enclosed please find four dollars in payment for *The Iron Age* for another year—a paper cheap at the price; saved on one operation lately four times its cost by the early tidings of a change in prices."

From WILLIAM P. BISSELL, Dealer in Hardware, Davenport, Iowa:

"Enclosed please find four dollars, amount of subscription to your paper, and it is worth the money every time."

From CHASE, BARKER & CO., Wholesale Hardware, Calais, Me.:

"We send you four dollars for *The Iron Age*, another year, and we take this opportunity to say that we get full value for our money. We find ourselves often posted ahead of runners, and we would not wish it to be discontinued for considerable money."

From R. G. MARTIN & CO., Dealer in Hardware, Stoves and Tinware, Monroeville, Ohio.

"I consider your paper invaluable, and wish it success."

From E. H. A. VAN SITTERT, Dealer in Hardware, Pella, Iowa.

"Couldn't very well get along without your valuable paper. Every Hardwareman should have a copy."

From DEWEY, VANCE & CO., Manufacturers of Iron, Nails and Spikes, Wheeling, W. Va.:

"We consider it the best publication of the kind extant."

From N. RUTTER & CO., Dealers in Hardware, Wilkes-Barre, Pa.:

"Your paper is valued very highly in our establishment, and we could not very well do without it."